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SPECIAL THEME ON CHARAKA SAMHITA - INDRIYA STHANA

(Part - 1 & 2)

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CONTENTS

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VOL 7
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VARNA SWAREEYAM OF CHARAKA INDRIYA STHANA - AN EXPLORATIVE STUDY

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REVIEW ARTICLE

VARNA SWAREEYAM OF *CHARAKA INDRIYA STHANA* - AN EXPLORATIVE STUDY

Abstract:
Charaka samhita (an ancient Indian textbook of medicine) has global recognition and most commonly referred text by *Ayurvedic* scholars and practitioners. It is having eight sections and *Indriya sthana* is one among them. *Indriya sthana* deals with various fatal signs and symptoms which denote imminent death and prognostication of life expectancy in the patients who are at end-of-life stages. *Varna swareeyam indriyam* is the first chapter among 12 chapters of *Indriya sthana* and it deals with various fatal signs and symptoms pertaining to skin colour and voice which denotes imminent death. The present study is aimed to explore the contents of '*Varna swareeyam indriyam*' chapter and to analyse their role and potential in contemporary clinical prognostication. Concepts such as the role of various factors related to the formation and development of human personality, definition and classification of '*Arishta lakshanas*' (fatal signs & symptoms indicates imminent death), physiological skin complexions, skin discolouration's, voice disorders and their prognostic significance, and various prognostic factors (which are having the potential of standard prognostic tools or models) are mentioned in this chapter. Most of the conditions mentioned in this chapter are acute, life threatening, and have poor prognosis such as cyanosis, skin pigmentation disorders, dysphonia, carcinomas, transient ischemic attack, hemiplegia, paraplegia, spinal cord injury, neuromuscular and neurodegenerative conditions, autonomic neuropathies, auto-immune diseases, and various inflammatory & infectious skin conditions etc. Further research works are required to substantiate the opinions or clinical experiences mentioned in this chapter in terms of their validity, reliability, generalizability and clinical applicability in contemporary medical practice.

Key Words: Autoimmune disease, Carcinoma, Discolouration, Dysphonia, Neurodegenerative diseases, Neuromuscular disorders

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INTRODUCTION:

Ayurveda is an ancient Indian system of medicine which has been in practice since thousands of years. '*Charaka samhita*' is a popular *Ayurvedic* textbook of medicine which has global recognition. The original source of '*Charaka samhita*' is '*Agnivesha samhita*' (which was written by *Agnivesha*, one among six disciples of sage *Punarvasu Atreya*) and it is based on the teachings of preceptor '*Punarvasu Atreya*'. The original '*Agnivesha samhita*' was later redacted, edited or recomposed by '*Charaka'* and '*Dridhabala'* and became popular as '*Charaka samhita*'. It has been popular among students, academicians, physicians and researchers as a reference book of *Ayurveda* globally. *Charaka samhita* was originally composed in *Sanskrit* (having 8 sections, 120 chapters and more than 9000 verses) and later it has been translated in to various languages (regional languages of India and also foreign languages) all over the world. There are more than 40 known commentaries written in *Sanskrit* are available (partially or fully) on *Charaka samhita* and '*Ayurveda Dipika*' commentary (written by *Chakrapanidatta*) has been the most popular amongst all. [1]

'*Indriya sthana*' is one among the eight sections of *Charaka samhita* and it comprises 12 chapters. Subject matter of *Indriya sthana* is 'Prognosis' and '*Indriya sthana*' is placed before '*Chikitsa sthana*' (treatment section) in *Charaka samhita*. *Indriya sthana* consist the description of '*Arishta lakshanas*' (signs and symptoms which denotes imminent death). Physician should avoid treating such type of patients who approach for treatment with *arishta lakshanas*. Patients suffering with diseases which are untreatable, progressive, and resistant to standard treatment protocol may display different fatal signs and symptoms (*arishta lakshanas*); physicians should be able to identify such signs or symptoms which denote imminent death and avoid treating such type of cases. With the help of '*Indriya sthana*', physician can identify various fatal signs and symptoms which denotes imminent death, assess the prognosis of a condition, to prognosticate the remaining survival time or life expectancy and also proper clinical decision making. [2&3] Knowledge of prognosis is essential for physician before initiating treatment hence '*Indriya sthana*' is placed before '*Chikitsa sthana*' in '*Charaka samhtia*'. '*Indriya sthana*' can be termed as '*Ayurvedic* prognostic science'.

अर्थविद्यायशोहानिमुपक्लेशमसंग्रहम्। प्राप्नुयान्नियतं वैद्यो योऽसाध्यं समुपाचरेत्॥
Artha vidya yasho ----- samupaacharet [*Verse* 8] [4]

अर्थः अर्थलाभः। हानिः क्षतिः। उपक्लेशो जनापवादः। असंग्रहः चिकित्सार्थमनुपादनं। असद्ग्रहो राजदण्डेनासत्पुरुषैश्चाण्डालादिभिर्ग्रहणम्॥
Artha ----- grahanam [*Verse* 8] [5]

Attempting to treat (समुपाचरेत्) incurable diseases (योऽसाध्यम्) leads to financial losses (अर्थ हानि), defamation, loss of reputation (यशो हानि), social harm (जनापवादः) and liable to legal punishments (राज दण्डन) to the treating physician. Hence physician should avoid treating incurable diseases to protect his reputation and dignity.

DEFINITION OF INDRA / INDRIYA:

इन्द्रशब्देन प्राण उच्यते तस्यान्तगतस्य लिङ्गं रिष्टाख्यमिन्द्रियं ॥ इन्द्रियमिन्द्रलिङ्गं ॥ [*Verse* 1&2] [5]

The word '*Indra'* denotes '*Prana'* (life force); and '*Indriya'* denotes signs which indicates end of life or fatal signs or signs indicating imminent death or '*Arishta lakshanas*' or red flag signs and symptoms etc. '*Indriya sthana*' is the section which comprises of '*Arishta lakshanas*'. [2&3]

SCOPE OF INDRIYA STHANA:

Estimating prognosis (the probability of an individual developing a particular outcome over a specific period of time) typically receives less attention than diagnosing and treating disease in clinical practice and training. The main aim of estimating prognosis is to improve clinical decision making and ultimately patient outcomes. Physicians should be properly trained to consider prognosis in their clinical decision making. [6] Prognosis is a key determinant of clinical decision-making because the risk benefit ratio for many interventions increases as patients approach the last weeks of life. [7] Prognosis plays a central role in medical decision making. Patients say that understanding prognosis is important for making life choices, like engaging in financial planning, arranging custodial care, and deciding when it's important for long-distance family members to visit etc. [8] Palliative care (PC) is a new field in medicine which is essential for patients with chronic advanced illness. End of life (EOL) care is defined as care that helps those with advanced, progressive, incurable, and serious illness to live as well as possible till death. Hospice care (HC) is a type of palliative care program for people in the final months of life and is considered when the person's condition deteriorates and active treatment does not control disease. [9]

Most of the conditions explained in *'Indriya sthana'* represents 'Actively dying', 'end of life', 'terminally ill', 'terminal care', and 'transition of care' etc situations where 'palliative care' or 'hospice care' or treatment at 'emergency departments' or 'intensive care units' (ICU) is required. Various acute conditions, surgical conditions, chronic debilitating diseases, incurable, treatment resistant conditions, emergency conditions, conditions which require ICU management, carcinomas, dementias, delirium, cachexia, end-of-life processes, immunocompromised states, conditions which require palliative or hospice care, conditions which are having poor prognosis, conditions which are having multimorbidity and require polypharmacy and geriatric syndromes etc are described in 'Indriya sthana'. With the help of 'Indriya sthana' physician can identify the fatal signs and symptoms and prognosticate the remaining life expectancy or survival time and also for proper clinical decision making.

CHARACTERISTIC FEATURES OF *ARISHTA LAKSHANAS*:

मृतमेव तमात्रेयो व्याचचक्षे पुनर्वसुः [*Verse* 25] [10]

(Fatal / Red flag signs & symptoms):

Arishta lakshanas are the fatal signs and symptoms which denote imminent death. Death definitely follows after the manifestation of *Aristha lakshana's* (prognostic accuracy could be estimated with sensitivity, specificity, positive predictive value, negative predictive value, and overall accuracy high positive predictive value, highly accurate, high sensitivity and specificity). In the last days of life, distinctive, bedside physical signs (Air:q l][ain) may signal that death is imminent (मृतमेव). Recognition that a patient has entered the last days of life presents a unique area for research. Instead of a prognostic question, this may be a diagnostic issue because the process of dying is irreversible (मृतमेव). There are several bedside clinical signs (अरिष्ट लक्षणानि) which have very high specificity rates for impending death (मृतमेव). [7]

क्षणेन भूत्वा ह्युपयान्ति [*Verse* 27&28] [11], व्यत्यासेन स्युः [*Verse* 12] [12]

लिङ्गमरिष्टाख्यमनेकम् [*Verse* 32] [10] & अनिमित्ताः स्युः [12] [*Verse* 12]

(Prognostic variables):

Due to the fluctuating or inconsistency or remitting - relapsing nature (क्षणेन भूत्वा ह्युपयान्ति) of '*Arishta lakshanas*' causes confusion to the physician and leads to clinical decision making errors. '*Arishta lakshanas*' are variable quantitatively and qualitatively (व्यत्यासेन स्युः). Response to treatment, development of acute complications, or competing comorbidities etc factors may change (क्षणेन भूत्वा ह्युपयान्ति & व्यत्यासेन स्युः) the patient's prognosis. It is important for physicians to revisit prognosis with patients over time. Prognostic factors may vary (क्षणेन भूत्वा ह्युपयान्ति & व्यत्यासेन स्युः) according to the stage of disease. [7] Life expectancy tables provide a potentially useful tool of conveying prognostic information to people with type II diabetes and suggest substantial scope for increasing longevity by improving modifiable risk factors. The variation in life expectancy suggests substantial scope for increasing longevity by improving modifiable risk factors (क्षणेन भूत्वा ह्युपयान्ति & व्यत्यासेन स्युः). [13]

Prognostication is a process instead of an event and prognostic factors may evolve over the course of the

disease (अनिमित्ताः स्युः). The accuracy of a prognostic tool varies by patient population and the time frame of prediction. Multiple prognostic scoring systems (अनेकम्) have been developed for patients suffering with various diseases. [7] Prognostic factor should be tested on various statistical parameters like sensitivity (correctly predicted deaths/total deaths), specificity (correctly predicted survivors/total survivors), positive predictive value (correctly predicted deaths/total predicted deaths), negative predictive value (correctly predicted survivors/total predicted survivors), false positives (incorrectly predicted deaths/total deaths), and false negatives (incorrectly predicted survivors/total survivors). [14] *Arishta lakshanas* are innumerable in number and there won't be any visible cause behind their manifestation. The word 'अनिमित्ताः' denotes hidden or subtle or latent cause and it doesn't indicate the mere absence of a cause. The word 'अनेकम्' denotes that *'Arishta lakshanas'* are variable and they are aplenty.

न स मोहादसाध्येषु कर्माण्यारभते भिषक् [*Verse* 47] [15]

(Biases by physician while prognostication):

Most clinical predictions made by physicians are based on clinical intuition or subjective assessments of complex situations. Unfortunately, clinical intuition is fallible (मोहात्). Clinicians make predictions about complex situations on a subjective or intuitive basis, they are prone to personal biases (मोहात्) and other problems associated with heuristics or "rules of thumb." For example, a 'value bias', 'reverse ego bias', 'availability heuristic', and 'representativeness heuristic' etc (मोहात्) makes a judgment process that is biased. Physicians' accuracy in estimating mortality risk of ICU patients has been variable. [14] It is not be possible to prognosticate with 100% accuracy. As death is a probabilistic event, its exact timing cannot be predicted with certainty. Some patients may survive longer than expected, whereas some may die earlier than expected. So, physicians can acknowledge the uncertainty, guide decision-making by providing general time frames, and advise patients and families to expect the unexpected. [7] Prognosis and life expectancy estimates carry a high degree of uncertainty. Improving the accuracy of prognostic estimates is important to reduce uncertainty. No matter what we do, there will always be some uncertainty in prognosis. Prognostic uncertainty has a profound influence on physicians, patients and their families. Optimistic bias (मोहात्)of physicians is well documented. Clinicians also may have trouble with prognostic uncertainty. [8]

आतुरे न स संमोहमायुर्ज्ञानस्य गच्छति [*Verse* 7] [16]

(Clinician as prognosticator):

Proper knowledge of *Arishta lakshana's* or prognostication makes the physician confident while assessing the prognosis and approaching the patient. The process of prognostication can be divided into formulation (foreseeing) and communication (foretelling). Clinicians may formulate prognosis either subjectively or objectively. Clinician prediction of survival (आयुर्ज्ञानस्य गच्छति) is instantaneous, convenient, easy to understand and often incorporates many known prognostic factors in its determination. [7] Clinically experienced physicians (आतुरे न स संमोह) have shown better performance than less experienced physicians. There is a wide variability in the prognostication performance (आतुरे न स संमोह) of physicians. Unfortunately, medical schools and textbooks have not been providing the appropriate training and information and physicians are not taught the appropriate skill sets to constantly record and evaluate their performance. Physicians should routinely record their prognostications (आयुर्ज्ञानस्य गच्छति) and review their performance to improve their abilities. [14]

कृत्स्नमायुर्ह्येनुवर्तते [*Verse* 28] [17]

(Prognostication of life expectancy or survival time):

Clinical decision making is dependent on '*Arishta lakshanas'* or 'Prognostication of life expectancy'. Various prognostic indices evaluate the risk of death over discrete time periods, ranging from 6 months to 9 years. Considering the number of different clinical decisions (अनुवर्तते) that must be made when caring for a diverse panel of patients, requires identifying the prognostic indices that best matches the specific time frame (e.g. 2, 5 or 10 years) (कृत्स्नमायुर्ह्ये) on a case-by-case basis. [6] Existing prognostic tools can facilitate clinical decision-making by providing approximated time frames (months, weeks, or days). Linking prognostication (कृत्स्नमायुर्ह्ये) to decision-making (AnuvtRte) is an important aspect (e.g. hospice eligibility is based on a survival of 6 months or less). Most of the studies have been focused on testing survival time frames with 1-year, 30-day and 7-day in advanced patients with cancer. The probabilistic question has been examined with the time frames of 24 hours, 48 hours, 1 week, 2 weeks, 1 month, 3 months, and 6 months. [7] A patient is eligible for hospice care if he or she has an estimated life expectancy of 6 months or less. Physicians should better define landmarks or turning points in prognosis and begin to acknowledge these to themselves and their patients. Only then can physicians adequately guide (अनुवर्तते) patients through the dying process. [18]

Throughout '*Indriya sthana'* various survival time frames (कालविशेषनियतारिष्टलक्षणानि) have been mentioned such as शीघ्रं शीघ्रं स हन्यते [*Verse* 21] [19], क्षिप्रं क्षिप्रं स हन्यते [*Verse* 22] [19], सहसा तस्य मृत्युर्हरति जीवितम् [*Verse* 23] [19], and क्षिप्रं यमक्षयमसंशयम् [*Verse* 16-18] [20] etc indicates death within

24 hours; सद्यो मुष्णाति जीवितम् [*Verse* 4] [21], शङ्खको नाम्ना त्रिरात्राध्दन्ति जीवितम् [*Verse* 20] [22], षड्रात्रं नातिवर्तते [*Verse* 8] [11], त्र्यहमेतेन जीवन्ति [*Verse* 7] [11], षड्रात्रं परमुच्यते [*Verse* 7] [11], सप्ताहं स जीवति विकत्थनः [*Verse* 19] [10], and व्रजति सप्तमीम् [*Verse* 11] [20] indicates death within 3-7 days; सोऽर्धमासं न जीवति [*Verse* 20] [10] and सोऽर्धमासं न जीवति [*Verse* 5] [23] indicates imminent death within 15 days; यस्य मासं न जीवति [*Verse* 10] [17], मासं न जीवति [*Verse* 12] [17], and मासांतं तस्य जीवितम् [*Verse* 3] [23] indicates death within 30 days; त्रीन् पक्षान्न स जीवति [*Verse* 22] [22] denotes death within 45 days; षण्मासान्न स जीवति [*Verse* 8] [17] indicates death within 6 months; and संवत्सरादेहं जहातीति विनिश्चयः [*Verse* 9] [12] & संवत्सरेण सः [*Verse* 4] [17] indicates death within 1 year.

द्विविधं हि रिष्टं नियतं चानियतं च [*Verse* 4&5] [12]

(Validity & Reliability of prognostic factors):

Arishta lakshanas are classified in to two groups, '*Niyata'* (accurately indicates death) (मृतमेव) and '*Aniyata'* (inaccurate) (संशयप्राप्तम्). Prognostic accuracy for a given prognostic factor or tool varies (संशयप्राप्तम्) by the definition of accuracy, the patient population, and the time frame of prediction. The exact timing of death cannot be predicted with certainty (संशयप्राप्तम्). There are established prognostic factors (नियत अरिष्ट लक्षणानि) in the advanced cancer setting which include decreased performance status, delirium, dysphagia, cancer anorexia–cachexia, dyspnea, inflammation and malnutrition etc. Patients of acute palliative care units had a median survival of 10 days and they have shown various complications like pneumonia, peritonitis, metabolic acidosis, and gastrointestinal bleed etc which were associated with a higher risk of mortality (नियत अरिष्ट लक्षणानि). Patients with a larger number of acute complications (नियत अरिष्ट लक्षणानि) also had a shorter survival. Calibration represents how well the predicted probability of survival based on a prognostic model matches the actual outcomes. The prognostic accuracy could be estimated with sensitivity, specificity, positive predictive value, negative predictive value, and overall accuracy (factors useful to define नियतम् & अनियतम्). Validation of existing prognostic factors/models is important. [7]

Prognostic factors should be tested for their reliability (नियतम्) by using the methods like intra-observer reliability (consistency of data re-measured by the same person or clinician) and interobserver reliability (consistency of data measured by different people). The kappa statistic is a measure of agreement that is scaled to 0 (chance agreement) (अनियतम्) and 1 (perfect agreement) (नियतम्). Individual prognostic variables (अरिष्ट लक्षणानि) should be tested for statistical association with the outcome (univariate analysis). The set of statistically significant variables from the univariate analyses should be subjected to multivariate analysis to assess their relative predictive performance. Multivariate logistic regression is most often used when the outcome is dichotomous (e.g., survival/death). Multivariate linear regression is utilized for continuous outcomes (e.g., length of stay); and multivariate linear or quadratic discriminant function analysis is used to predict categorical outcomes. Two essential and objective aspects of the validation process are testing for discrimination and calibration. Scoring systems or prediction rules should also pass a standard of clinical reasonableness or sensibility. [14]

क्रियापथमतिक्रान्ताः केवलं देहमाप्लुताः तदरिष्टम् [*Verse* 29] [17]

(Mortality risk):

The process of dying is irreversible (क्रियापथमतिक्रान्ताः) and recognizing that a patient has entered the last days of life presents a unique area for research. Several bedside clinical signs (चिह्नम् कुर्वन्ति) have very high specificity rates for impending death (तदरिष्टम्). Sentinel events such as cancer diagnosis, disease progression, and hospitalizations should trigger a prognostic discussion. [7] Illness understanding scores consists of four indicator variables, patient terminal illness (क्रियापथमतिक्रान्तaः) acknowledgment, recognition of incurable disease status (क्रियापथमतिक्रान्ताः), knowledge of the advanced stage of the disease (क्रियापथमतिक्रान्ताः), and expectation to live months as opposed to years. [24] There are generally three groups of patients: those who have a palliative period of advancing progressive disease (क्रियापथमतिक्रान्ताः); those who have a stable or no disease, relatively few symptoms but then deteriorate or die suddenly; and those who suffer from chronic disease, where the disease is not clearly progressing. [9] *Arishta lakshanas* denote terminal illness, progressive and advancing disease, irreversible damage and impending death.

संपश्येदन्यान्येवंविधानि च [Verse 23] [22] & तानि सर्वाणि लक्ष्यन्ते [Verse 24] [22]

(Evidence synthesis in Prognostic research):

Novel prognostic factors (संपश्येदन्यान्येवंविधानि) may improve rates of accuracy. Many prognostic models (तानि सर्वाणि लक्ष्यन्ते) are available, including the Palliative Prognostic Score, the Palliative Prognostic Index, and the Glasgow Prognostic Score. To advance the science of prognostication, the accuracy of existing and novel prognostic markers and models (संपश्येदन्यान्येवंविधानि) need to be routinely assessed. Research studies of novel prognostic markers (संपश्येदन्यान्येवंविधानि) should aim at improving the rate of accuracy of established

prognostic model; thus, reclassification statistics should be consistently reported. [7] Another very important issue in clinical use of prediction methods is continuous updating (संपश्येदन्यान्येवंविधानि). As medicine advances, the relationships among clinical variables, therapies, and outcomes will change, requiring updating (संपश्येदन्यान्येवंविधानि) of the prognostication methods. Computer-based clinical decision support systems (CDSS) have been proposed to help clinicians in a variety of settings. Such analyses could focus on the outcomes relevant to the individual patient and be constructed (संपश्येदन्यान्येवंविधानि) to maximize the accuracy and reliability for a specific person. [14] Physician should use his own analytical skills and personal experience to identify various *Arishta lakshanas* in diverse patient populations. *Arishta lakshanas* described in '*Indriya sthana*' are for example purpose only and they don't include all possible forms.

VARNA SWAREEYAM INDRIYAM:

Arishta lakshana's (signs of impending death) pertaining to complexion and voice are explained in the present chapter. The present chapter named *'Varna swareeyam indriyam'* because it deals with *arishta lakshanas* of '*Varna'* (body complexion or colour) and '*Swara'* (frequency, rhythm, tone, resonance and pitch of voice). Concepts related to '*Prakruti'* (development of personality), definition and classification of *arishta lakshanas*, and brief summary of the contents of whole '*Indriya sthana*' are mentioned in this chapter. [24]

PROGNOSTIC FACTORS:

इह खलु वर्णश्च स्वरश्च गन्धश्च रसश्च स्पर्शश्च चक्षुश्च श्रोत्रं च घ्राणं च रसनं च स्पर्शनं च सत्वं च भक्तिश्च शौचं च शीलं चाचारश्च स्मृतिश्चाकृतिश्च प्रकृतिश्च विकृतिश्च बलं च ग्लानिश्च मेधा च हर्षश्च रौक्ष्यं च स्नेहश्च तन्द्रा चारम्भश्च गौरवं च लाघवं च गुणाश्चाहारश्च विहारश्चाहारपरिणामश्चोपायश्चापायश्च व्याधिश्च व्याधिपूर्वरूपं च वेदनाश्च उपद्रवाश्च च्छाया च प्रतिच्छाया च स्वप्नदर्शनं च दूताधिकारश्च पथि चौत्पातिकं चातुरकुले भावावस्थान्तराणि च भेषजसंवृत्तिश्च भेषजविकारयुक्तिश्चेति परीक्ष्याणि प्रत्यक्षानुमानोपदेशैरायुषः प्रमाणविशेषं जिज्ञासमानेन भिषजा ॥

Iha khalu varnashcha ---- bhishajaa [*Verse* 3] [24]

सत्वं मनः। भक्तिः इच्छा। शीलं सहजं वृत्तम्। आचारः शास्त्रशिक्षाकृतो व्यवहारः। निद्रादौर्बल्यात्तन्द्रेति तन्द्रा शब्देन निद्रोच्यते।

Sattvam ---- nidra uchyate [*Chakrapani*, *Verse* 3] [24]

The above verse denotes the brief summary of the contents of whole '*Indriya sthana*'. *Arishta lakshanas* (prognostic factors) pertaining to body complexion or skin colour (वर्णश्च), frequency or rhythm or pitch or resonance or tone of voice (स्वरश्च), body odour (गन्धश्च), blood chemistry or composition (रसश्च), tactile sensations (स्पर्शश्च), sensory organs (चक्षुश्च श्रोत्रं च घ्राणं च रसनं च स्पर्शनं च), psychological (सत्वम्), mood related (हर्षश्च & भक्तिश्च), personality (शीलम्) and behavioural or conduct changes (आचारश्च), cognitive functions (मेधा), memory (स्मृतिश्च), body configuration (आकृतिश्च), physiological (प्रकृतिश्च), and pathological changes (विकृतिश्च), energy levels (बलम्), fatigue (ग्लानिश्च), unctuousness (स्नेहश्च), roughness (रौक्ष्यं च), sleep disturbances (तन्द्रा), origin or initial manifestation of *arishta lakshana* (आरम्भश्च), body weight (गौरवं च & लाघवं च), diet (गुणाश्चाहारश्च), life style (विहारश्च), digestive processes (आहारपरिणामश्चोपायश्चापायश्च), diseases (व्याधिश्च), premonitory stage of diseases (व्याधिपूर्वरूपं च), pain (वेदनाश्च), complications (उपद्रवाश्च), body reflections (च्छाया च), shadows (प्रतिच्छाया च), dreams (स्वप्नदर्शनं च), caregiver related (दूताधिकारश्च), and various good or bad omens which appears at patients house or on the way to patients house or at the time of preparing and administering medicines (पथि चौत्पातिकं चातुरकुले च भेषजसंवृत्तिश्च भेषजविकारयुक्तिश्चेति) etc are described in '*Indriya sthana*'. Various measuring scales, questionnaires, instruments etc are available now to measure the above-mentioned prognostic factors quantitatively (Table 1). [25-80] The word 'आयुषः प्रमाणविशेषं जिज्ञासमानेन भिषजा' denotes 'Prognostication of life expectancy' or 'Assessment of survival time frame'.

तत्र तु खल्वेषां परीक्ष्याणां कानिचित् पुरुषमनाश्रितानि कानिचिच्च पुरुषशंश्रयाणि । तत्र यानि पुरुषमनाश्रितानि तान्युपदेशतो युक्तितश्च परीक्षेत पुरुषसंश्रयाणि पुनः प्रकृतितो विकृतितश्च ॥

Tatra tu khalveshaam ---- vikruti tashcha [*Verse* 4] [24]

पुरुषमनाश्रितानि दूताद्याश्रयाणि रिष्टानि।

Purushamanaashritaani ---- rishtaani [*Chakrapani*, *Verse* 4] [24]

Arishta lakshanas or prognostic factors are of two types (पुरुषशंश्रयाणि - which can be found in patient's body and पुरुषमनाश्रितानि - situated in patient's surroundings but not found inside his body). पुरुषशंश्रयाणि *Arishta lakshanas* can be elicited by physical or clinical examination (various *arishta lakshanas* such as red flag signs or symptoms, fatal signs indicating imminent death etc comes under this category) whereas पुरुषमनाश्रितानि *Arishta lakshanas* could be found only with the help of scriptures and intuition (various *arishta lakshanas* related to caregiver, social and economic factors, family support, and good or bad omens etc comes under this category). Clinicians may formulate prognosis either subjectively (ie, clinician prediction of survival based on intuition) (युक्तितश्च परीक्षेत) or objectively (ie, actuarial prediction of survival based on prognostic factors and models) (परीक्षेत प्रकृतितो विकृतितश्च). Despite the availability of validated prognostic factors and tools, most health care professionals rely on clinician prediction of survival to estimate prognosis because clinician prediction of survival (युक्तितश्च परीक्षेत) is instantaneous, convenient, and easy to understand. In the last days of life, distinctive, bedside physical signs

(पुरुषसंश्रयाणि प्रकृतितो विकृतितश्च परीक्षेत) may signal that death is imminent. Prognostic factors can generally be classified as disease- and patient-related factors (पुरुषसंश्रयाणि). Patient-related factors (पुरुषसंश्रयाणि) have a prominent role in prognostication in the last months or weeks of life. [7]

Most clinical predictions by physicians are based on clinical intuition or subjective assessments (युक्तितश्च परीक्षेत) of complex situations. Unfortunately, clinical intuition is fallible. Several studies have cast doubt on the ability of physicians to judge accurately the probability of clinical outcomes based on subjective assessments (युक्तितश्च परीक्षेत). Personal biases occur when physicians make predictions on a subjective or intuitive basis. Unfortunately, there are no training programs (उपदेश) for physicians to specifically improve their prognostication performance. Texts (उपदेश) infrequently mentioned death, the dying process or the effects of end-of-life changes on patients and their families. [14] Scriptures or literature, previous research works, physicians clinical experience, skill and intuitions made by the expert physician etc factors all together makes the physician accurate in predicting the prognosis with minimum errors.

तत्र प्रकृतिर्जातिप्रसक्ता च कुलप्रसक्ता च देशानुपातिनी च कालानुपातिनी च वयोऽनुपातिनी च प्रत्यात्मनियता चेति। जातिकुलदेशकालवयःप्रत्यात्मनियता हि तषां पुरुषाणां ते ते भावविशेषा भवन्ति॥

Tatra jaati prasakta ---- vishesha bhavanti [*Verse* 5] [24]

जातिप्रसक्ता यथा ब्राह्मणजातौ शौचं। कुलप्रसक्ता यथा किञ्चिदेव कुलं शुच्याचारवद्भवति। देशानुपानिती यथा अन्तर्वेदिवासिनः शुचयो भवन्ति। कालानुपातिनी यथा कृतयुगे शौचं। वयोऽनुपातिनी यथा बाल्येऽशौचं। प्रत्यात्मनियता यथा कश्चिदेव पुरुषः प्रकृत्या शुचिर्भवति।

Jaati prasaktaa ---- shuchirbhavati [*Chakrapani, Verse* 5] [24]

Factors of Personality:

There are five factors (biological, social, cultural, physical environment and situational) which could contribute to the formation and development of human personality. Children born in a particular family inherits many features and traits from their parents. Children often inherit their physical and psychological characteristics from their parents (e.g. courage, intelligence, cleanliness etc). When an individual interacts with other people of his community or caste or peers, he gets influenced by them. Various social factors (जाति कुल प्रसक्ता) like family, peer groups, media and society etc whatever comes in contact with an individual's social life affects his personality. An individual belongs to or living in a particular culture (जाति कुल प्रसक्ता) adopts the characteristics of that particular culture in to his personality. Various environmental factors (देश काल अनुपानिती) like geographical location, rivers, mountains, forests, temperature, monsoon, and atmosphere etc influences the feeling, attitudes, habits, behaviour and emotions of people living there. Body structure, physique, colour and health etc factors are influenced by environment. Situational factors (देश काल वयोऽनुपातिनी) also influences the way of behaviour of a particular individual according to various situations. All the above five factors together are responsible for the formation and development of unique individual personality (प्रत्यात्मनियता). [81] 'शौचम्' (Hygiene or cleanliness) is one of the personality characters selected as an example (commonly found as contamination obsessions or cleanliness compulsions as a personality trait in obsessive compulsive personality disorder or symptom in obsessive compulsive disorder) to explain the above verse by the commentator '*Chakrapani'*. Hygiene is predominant in particular communities, casts, countries, generations, age groups and in particular individuals when compared to others. *Chakrapani* says that, parents influence the psychic trait of the progeny due to some special effect (*Prabhava*) and he coined a term called '*sattva anukarana*' (imitating or observational learning or role modelling) for the same. [82]

Many researchers have come to the conclusion that there is a relation between religiosity, spirituality (जाति कुल प्रसक्ता) and magical ideations with some OCD (Obsessive Compulsive Disorder) traits. [83] Evidence has shown that that there is a gender difference in the frequency of symptom dimensions of OCD. The frequency of some dimensions (such as sex, religion, and hoarding) (जाति कुल प्रसक्ता) in OCD is different from what has been reported in some Western countries and some other Asian countries (देश अनुपातिनी). This difference in the frequency of OCD symptoms may be the result of socio-cultural factors (जाति कुल देश etc) playing a role in shaping the character of the symptom presentation. [84] There have been multiple etiological theories of OCPD (Obsessive Compulsive Personality Disorder). Freudian theorists have posited fixation or strict parenting (जाति कुल प्रसक्ता) during anal-psychosexual stage. Where Erikson pointed to a failure in the psychosocial stage with the conflict in autonomy versus shame, social learning theorists (देश काल वयोऽनुपातिनी) claimed that it is due to maladaptive vicarious learning. Biological theories also have defined certain causal factors like heritability or genetic influences (प्रत्यात्मनियता). [85]

विकृतिः पुनर्लक्षणनिमित्ता च लक्ष्यनिमित्ता च निमित्तानुरूपा च॥ तत्र लक्षणनिमित्ता नाम सा यस्याः शरीरे लक्षणान्येव हेतुभूतानि भवन्ति दैवात्। लक्षणानि हि कानिचिच्छरीरोपनिबध्दानि भवन्ति यानि हि तस्मिंस्तस्मिन् काले तत्राधिष्ठानमासाद्य तां तां विकृतिमुत्पादयन्ति॥ लक्ष्यनिमित्ता तु सा यस्या उपलभ्यते

निमित्तं यथोक्तं निदानेषु। निमित्तानुरूपा तु निमित्तार्यानुकारिणी या तामनिमित्तां निमित्तमायुषः प्रमाणज्ञानस्येच्छन्ति भिषजो भूयश्चायुषः क्षयनिमित्तां प्रेतलिङ्गानुरूपां यामायुषोऽन्तर्गतस्य ज्ञानार्थमुपदिशन्ति धीराः। यां चाधिकृत्य पुरुषशंश्रयाणि मुमूर्षतां लक्षणान्युपदेक्ष्यामः॥

Vikruti punah lakshana ---- upadekshyaama [*Verse* 6-7] [24]

आयुषः प्रमाणज्ञानस्येति आयुःशेषप्रमाणज्ञानस्येत्यर्थः।

Aayusha ---- ityardhaha [*Chakrapani*, *Verse* 7] [24]

***Lakshana & Lakshya nimitta*:**

The pathological conditions or features can be classified in to three groups (लक्षणनिमित्ता, लक्ष्यनिमित्ता & निमित्तानुरूपा); '*Lakshana nimitta*' are various signs or symptoms or bodily changes which may present at birth or may manifest clinically at a later age. Specific etiological factors may not be found behind their manifestation. The word 'दैवात्' denotes 'idiopathic' or 'destiny' or 'consequences of past actions or deeds' etc. The signs and symptoms come under this category may denote congenital and hereditary anomalies or genetic predisposition or vulnerability. Genetics plays a role, with varying extent, in almost all diseases including common disorders to rarest. Variations in our DNA and differences in how that DNA functions, alongside the environment (which encompasses lifestyle), contribute to disease processes and also susceptibility to develop a specific disease. The environment plays a significant role in many conditions, but our cellular and bodily responses to the environment may differ according to our DNA. The genetics of the immune system, with enormous variation across the population, determines our response to infection. Most cancers result from an accumulation of genetic changes that occur throughout the lifetime of an individual, which may be influenced by environmental factors. [86] Previous research works have predicted that variability at genes causing young onset (तस्मिंस्तस्मिन् काले) autosomal recessive neurological diseases would contribute to late onset (तस्मिंस्तस्मिन् काले) neurological diseases. Both AD (Alzheimer's dementia) and PD (Parkinson's disease) are late onset (तस्मिंस्तस्मिन् काले), progressive, and genetically complex diseases. [87]

Prgnaaparaadha of present life or previous life (also known as *karma*) has been explained as an etiological factor for the manifestation of various diseases. *Karma* (deeds of past life) was also quoted as an etiological or causative factor for diseases in which causative factors may not be traceable. This theory (*Karma*) is one of the foundational theories of all Indian philosophies and *Ayurveda* is no exception. Actions of past life are linked to the manifestation of various diseases and such diseases (*Karmaja vikara*) are untreatable. They are cured only after the results of past actions are exhausted. *Chakrapani* has quoted that acts like charity (*daana*), study (*adhyayana*), and religious austerities (*tapa*) etc are followed up from the past life to present and present life to the next one. [82] Various other factors such as good or bad fortunes comes under 'लक्षणनिमित्ता' category can be understood only with the help of '*Jyotishya shastra*' or '*Shakuna* or *Nimitta shastra*' or '*Samudrika shastra*' etc. '*Lakshya nimitta*' denotes various signs or symptoms of diseases or pathological conditions in which the causative factors can be traceable.

***Nimittanurupa*:**

'निमित्तानुरूपा' group denotes signs and symptoms which denote imminent death but they are not the causative or etiological factors which actually leads to death. This category denotes 'red flag signs or symptoms' which resembles with etiological or causative factors but in fact they are not. Various *arishta lakshanas* mentioned throughout the *Indriya sthana* comes under this category. Physician should pay due attention to these factors to prognosticate the remaining life expectancy. The most common red flag symptoms (प्रेतलिङ्गानुरूपाम्) seen in cancer patients were "persistent unexplained pain" followed by "persistent change in bladder habits" and "persistent change in bowel habits". Hence, physicians should receive training toward opportunistic screening for alarming symptoms of cancer (प्रेतलिङ्गानुरूपाम्) patients followed by proper referral to higher centres for suspected cases which can help to improve the case detection rate from the lowest possible level of health care. [88] Systemic lupus erythematosus (SLE) is a chronic autoimmune connective tissue disorder, with a heterogeneous presentation. It is associated with diverse abnormalities of the skin, kidney, and musculoskeletal and haematological systems. SLE is protean in its manifestations and follows a relapsing and remitting course. Disease severity is wide ranging, SLE can present major challenges because of accrued organ damage, coagulation defects and it is potentially fatal (प्रेतलिङ्गानुरूपाम्) depending on organ involvement. [89]

The medical literature presents and promotes red flags to increase the likelihood of identifying a secondary etiology (निमित्तानुरूपा). Clinical experience and large case series of patients with a specific secondary headache form the basis for many red flags (प्रेतलिङ्गानुरूपाम्). Around 18% of patients with a headache have a secondary headache disorder (निमित्तानुरूपा). [90] Hypopharynx is the most common primary site, followed by the base of tongue and anterior tongue for 'Oral squamous cell carcinoma' (OSCC). The distant metastasis plays a critical role in the management and prognosis (प्रेतलिङ्गानुरूपाम्) of oral cancer patients. Metastasis means the spread of the disease from one organ to another which are not directly connected. Metastasis starts from detaching the cancer cells from the primary site, spreading in the tissue, moving away through the extracellular matrix, invading blood vessels, and

settling in the microvasculature, finally extravasating through the vessel wall and proliferating in the recipient tissue. In OSCC distant soft tissue metastases most commonly occurred in lungs, heart, and different bones (such as vertebral bones and jaw bone). [91] By considering all the above facts it is evident that, 'लक्षणनिमित्ता' denotes various features or signs & symptoms having 'Idiopathic' or 'Genetic' or 'Congenital' origin, 'लक्ष्यनिमित्ता' denotes primary signs and symptoms which are due to the direct result of pathogen activity or invaded tissue (primary disease), and 'निमित्तानुरूपा' denotes secondary symptoms result from the physiological effects of disease (primary) on distant tissues and un invaded organs (secondary disease) (distant metastasis having primary tumour somewhere else).

आयुषः प्रमाणज्ञानस्येति (Prognostication of life expectancy):

The word 'आयुषः प्रमाणज्ञानस्येति' means 'आयुःशेषप्रमाणज्ञानस्येत्यर्थः' which denotes 'Prognostication of remaining life expectancy' or 'calculating survival time frame' after the manifestation of '*Arishta lakshanas*' or Red flag signs or symptoms. Life expectancy is an estimate of the number of remaining years of life a person has, is an important consideration for making clinical decisions. Referral to hospice care is often based on a life expectancy of less than 6 months. Most currently available life expectancy calculators or life tables are based on a person's age, gender, and race. [92] Various disease specific and non-disease specific prognostic indices are available now to calculate the remaining life expectancy in wide variety of patient populations. Various factors like index quality, potential for bias, generalizability, and accuracy etc influences the remaining life expectancy estimations. While neither a clinician nor an index can predict with absolute certainty how long a person will live, validated prognostic indices might improve the accuracy of the prognostic assumptions that influence our clinical decisions. [93] Clinicians have developed prognostic tools to predict how long a person will survive, most often a patient who is severely ill. Such estimates help physicians assess the costs and benefits of interventions and assist patients and families in making healthcare decisions. Better prognostic tools may encourage physicians to have conversations with their patients and such discussions may empower individuals to have more control over their final years of life and reduce unnecessary treatment that may compromise end-of-life quality. [94] Various concepts related to prognostication of life expectancy have already been discussed in previous section ('Characteristic features of *Arishta lakshanas*').

तत्रादित एव वर्णाधिकारः तद्यथा कृष्णाः श्यामः श्यामावदातः अवदातश्चेति प्रकृतिवर्णाः शरीरस्य भवन्ति यांश्चापरानुपेक्षमाणो विद्यादनूकतोऽन्यथा वाऽपि निर्दिश्यमानांस्तञ्ज्ञैः ॥

Tatraadita eva --- tatgnai [*Verse* 8] [24]

अवदातो गौरः।

Avadaato gauraha [*Chakrapani*, *Verse* 8] [24]

There are four types of normal complexions कृष्णाः, श्यामः, श्यामावदातः and अवदात. Many more complexions can also be found due to the combinations of these four complexions. Human skin varies from dark pigmentation or black in Africans to very light or white in Celtics. Multiple contributing factors affect skin colour. These factors are melanin, hemoglobin, the level of blood oxygenation, and chromophores. There are sophisticated instruments (Minolta Chromameter, Mexameter etc) for providing objective measurements and these are reliable and have been proven as valid for the evaluation of skin colour. Rating scales such as a physician's global assessment, visual hyperpigmentation scale (Taylor hyperpigmentation scale) and the Felix von Luschan skin colour etc are reliable and inexpensive and non-invasive. [95] Skin colour assessment methods can be categorized in to subjective and objective. A non-invasive method, diffuse reflectance spectroscopy (DRS), is considered to be the gold standard for objective quantitative measurement of skin colour. Hand-held ColorTec® spectrophotometer instrument can also be used and it is recognized as the gold standard for skin colour measurements. [96] Fitzpatrick skin type classification denotes six different skin types, skin colour, and reaction to sun exposure which ranges from very fair (skin type I) to very dark (skin type VI). The objective assessment of Fitzpatrick skin types can be done by using a device 'Dermatone Skin Analyzer™', which provides an accurate analysis of skin tones based on the skin's concentrations of melanin, haemoglobin, and skin reflection properties. [25] *Prakruta varnas* mentioned in the above verse can be classified or measured by using 'Fitzpatrick classification of skin types' (Table 2).

नीलश्यावताम्रहरितशुक्लाश्च वर्णाः शरीरस्य वैकारिका भवन्ति यांश्चापरानुपेक्षमाणो विद्यात् प्राग्विकृतान भूत्वोत्पन्नान् इति प्रकृतिविकृतिवर्णा भवन्त्युक्ताः शरीरस्य ॥

Neela shyaava ---- shareerasya [*Verse* 9] [24]

नील (cyanosis), श्याव (brownish pigmentation), ताम्र (reddish brown pigmentation), हरित (greenish or yellowish green), and शुक्ल (pallor) etc are considered as pathological complexions. Sudden manifestation of these pathological discolorations without any visible cause is considered as '*Arishta lakshana*' (Table 3).

नील (*Neela*):

Cyanosis is a pathological condition characterized by a bluish discoloration (नील) of the skin or mucous membrane. The word cyanosis is a derivative of the word cyan, a blue-green colour (नील). [97] Acrocyanosis

is a functional peripheral vascular disorder characterized by bluish discoloration (nIl) of skin and mucous membrane due to diminished oxyhemoglobin. [98] If cyanosis is limited to the extremities, it is referred to as acrocyanosis or peripheral cyanosis. [99]

श्याव (*Shyaava*):

Melasma is a symmetric acquired hypermelanosis, with stains in shades of brown to bluish gray (श्याव), with irregular borders and located in more photo-exposed areas. Hyperchromic brown spots (श्याव) can be seen in phytophotodermatoses. Cervical idiopathic poikiloderma or poikiloderma of Civatte (PC) is a benign dermatosis characterized by pigmentation which is reticulated, reddish to brown (श्याव), with irregular and symmetrical distribution. Acanthosis nigricans (AN) appears as hyperchromic plaques, with dark brown to black colouration (श्याव), located in the armpits, groin, neck and other intertriginous areas. Macular amyloidosis presents clinically as macules, spots or pruritic hyperpigmented plaques of a brownish or blackish colour (श्याव) with ill-defined borders. Nodular or tumefactive amyloidosis is another type of localized cutaneous amyloidosis, is characterized by diffuse amyloid deposits in the dermis, subcutaneous tissue and small dermal capillaries. Patients present with nodules or asymptomatic plaques of rosy to brownish colour (श्याव). Confluent and reticulated papillomatosis (CRP) is characterized by flat wrinkled papules, slightly salient, with variable colouration, hypochromic to pink or brownish (श्याव) that become confluent in the centre and reticulated at the periphery. [100]

ताम्र (*Taamra*):

Wilson's disease (WD) is characterized by abnormal copper accumulation. Neurologic, psychiatric and hepatologic problems in WD are nonspecific. The most important are Kayser–Fleischer rings caused by asymptomatic copper deposition in Descemet's corneal membrane and they are visible by naked eye as a golden-brownish pigmentation (ताम्र) around the limbus. [101] WD may sometimes have certain atypical presentations such as presenting with generalized hyperpigmentation of skin (ताम्र) followed by neurological manifestations. [102] Pigmented purpura presents with non-blanching copper-coloured patches (ताम्र) involving the pretibial areas of the legs or the dorsum of the feet. Pigmented purpuric dermatoses seen in late stage diabetes in patients with nephropathy and retinopathy and occurs due to microangiopathic damage to capillaries and sequential erythrocyte deposition. [103] Chromoblastomycosis is a chronic, granulomatous fungal infection caused by pigmented dematiaceous fungi. The presence of reddish-brown (ताम्र) and black dots corresponding to the fungal sclerotic bodies and haemorrhage are the most useful dermoscopic feature in diagnosing this infection. [104]

हरित (*Harita*):

A green cast (हरित) to the jaundice indicates prolonged obstruction, while an orange-yellow colour is more compatible with a hepato-cellular mechanism. Dark urine resembling tea, which develops green foam (हरित) on shaking, is caused by bile pigment. [105] In Necrotizing fasciitis (NF), a thin, foul, murky fluid with blackened necrotic fascia is found in patients with a mixed facultative anaerobic infection. The process extends into the overlying fat as patchy greenish-black (हरित) liquefaction necrosis. [106] Green pigmentation (हरित) on the palms and soles in patients with hyperbilirubinemia is a rare entity. [107]

शुक्ल (*Shukla*):

Cutaneous hypopigmentation (शुक्ल) enclose a wide range of disorders, which can be mainly differentiated based on the age of onset (congenital or acquired), the extent of involvement (diffuse or localized) and the underlying aetiology. Acquired hypomelanosis (शुक्ल) is seen in various conditions like kwashiorkor, vitiligo, halo nevi, linear lichen sclerosis, post inflammatory or secondary hypopigmentation, and tuberculoid leprosy etc. [108] Signs traditionally used in the physical diagnosis of anaemia are pallor (शुक्ल) of the conjunctivae, nail beds, face, palms, and palmar creases. [109] Skin pallor (शुक्ल) can be seen in chronic kidney disease also. [110]

तत्र प्रकृतिवर्णमर्धशरीरे विकृतिवर्णमर्धशरीरे द्वावपि वर्णौ मर्यादाविभक्तौ दृष्टवा् यद्येवं सव्यदक्षिणविभागेन यद्येवं पूर्वपश्चिमविभागेन यद्युत्तराधरविभागेन यद्यन्तर्बहिर्विभागेन आतुरस्यारिष्टमिति विद्यात् एवमेव वर्णभेदो मुखेऽप्यन्यत्र वर्तमानो मरणाय भवति॥
Tatra prakruti ---- maranaaya bhavati [*Verse* 10] [24]
अन्तर्बहिर्विभागेनेति अत्रान्तर्गतो वर्णो मुखनासाकर्णश्रोत्रान्तर्गततया उन्नेयः।
Antarbahi --- unneyaha [*Chakrapani*, *Verse* 10] [24]

Half of the body (anterior or posterior, upper or lower, inner or outer and right or left) having normal complexion and another half with abnormal complexion with clear cut demarcation line between them (normal and abnormal complexions), should be considered as '*Arishta lakshana*'. Abnormal discolouration occurring in half of the body or face without having any apparent reason should be considered as '*Arishta lakshana*'. Various conditions can cause the discoloration or hyperpigmentation in half of the body or face as described in the following sections (Table 3).

सव्यदक्षिणविभागेन (*Savya dakshina vibhaagena*):

Harlequin colour change is a distinctive phenomenon presents as a well-demarcated (मर्यादाविभक्तौ) colour change

(वर्णभेदो), with one half of the body displaying erythema and the other half pallor (सव्यदक्षिणविभागेन). The condition is benign, and the change of colour fades away with in few minutes. It may recur when the infant is placed on her or his side. Some authors have speculated that its pathogenesis involves temporary imbalance in the tone of cutaneous blood vessels secondary to hypothalamic immaturity (मरणाय भवति ?). [111]

उत्तराधरविभागेन (*Uttara adhara vibhaagena*):

Differential cyanosis refers to the appearance of cyanosis in both lower extremities (lower extremities are blue in colour) (उत्तराधरविभागेन) (वर्णभेदो). This is seen in patent ductus arteriosus with pulmonary arterial hypertension. In reverse differential cyanosis (lower extremities have higher oxygen saturation than the upper extremities) (उत्तराधरविभागेन), the arms are more cyanotic than the legs (उत्तराधरविभागेन) which can be seen in TGA with coarctation of the aorta or interrupted aortic arch, and TGA with supra systemic pulmonary vascular resistance. [112] Flushing usually includes the face, neck, upper portion of the chest, and upper limbs (उत्तराधरविभागेन). Flushing can be episodic or constant. Various conditions can cause flushing such as carcionoid, pheochromocytoma, mastocytosis, medullary thyroid carcinoma, pancreatic cell tumour, renal cell carcinoma, and neurological conditions (Migraine, Parkinson's, trigeminal neuralgia, multiple sclerosis, Horner syndrome, Frey syndrome, autonomic epilepsy, autonomic hyper reflexia, orthostatic hypotension, and Streeten syndrome). [113] After spinal cord injury, centrally mediated sympathetic control of circulation may be lacking in the lower part of the body (उत्तराधरविभागेन). This can lead to vasodilatation of peripheral vessels and to a decrease in vascular resistance below the lesion. The part of the body below the spinal lesion (उत्तराधरविभागेन) is paralyzed and extremely inactive, which may affect the vascular properties in this part of the body as well. [114]

पूर्वपश्चिमविभागेन (*Purva pashchima vibhaagena*):

Lying in a particular position for a long time (chronic bed ridden patients) may cause pressure sores due to the prolonged contact of the skin with an object like a bed. The beginning signs of a pressure sore include discoloration of skin (red or blue or purple) in the areas like hip bone, tail bone, spine, shoulder blades, elbows, back of the head, knees and heels (posterior surfaces of the body) (पूर्वपश्चिमविभागेन). [115]

अन्तर्बहिर्विभागेन (*Antah bahir vibhaagena*):

Major acquired hyperpigmentations (due to increased melanin) (बहिर्विभागेने) can be seen in conditions like melasma, post inflammatory hyperpigmentation (PIH), periorbital pigmentation, dermatosis papulosa nigra, phyto-photodermatoses, flagellate dermatosis, erythema dyschromicum perstans, cervical poikiloderma, acanthosis nigricans, cutaneous amyloidosis and reticulated confluent dermatitis etc. [116] Generalized hyperpigmentation (बहिर्विभागेने) can also be seen in 'Grave's disease' [117] and 'Wilson's disease. [118] Pigmentations are commonly found in the mouth (मुखान्तर्गत वर्णभेद) and they represent various clinical patterns ranging from physiologic changes to oral manifestations (मुखान्तर्गत वर्णभेद) of systemic diseases and malignancies. Colour changes in the oral mucosa (मुखान्तर्गत वर्णभेद) can be attributed to the deposition of endogenous or exogenous pigments and they can be in the form of blue/purple vascular lesions, brown melanotic lesions & heme-associated lesions, and gray or black pigmentations (मुखान्तर्गत वर्णभेद). [119] Sinonasal melanosis (नासान्तर्गत वर्णभेद) is a mucosal pigment deposition often associated with a proliferation of melanocytes in a single area. Nasal melanosis (नासान्तर्गत वर्णभेद) may be a precancerous lesion and may transform into melanoma. [120] Nevus of Ota or Oculodermal melanocytosis is characterized by hyperpigmentation of the facial skin in the distribution of the first and second divisions of the trigeminal nerve. The melanocytosis also affects the oral cavity (मुखान्तर्गतवर्णभेद), nasal mucosa (नासान्तर्गत वर्णभेद), external auditory canal (कर्णश्रोत्रान्तर्गतवर्णभेद), tympanic membrane (कर्णश्रोत्रान्तर्गतवर्णभेद), orbital fissures, meninges and the brain. [121]

वर्णभेदो मुखेऽपि (*Varna bhedho mukhe api*):

Unilateral (happens in only one side of the face) facial flushing (एवमेव वर्णभेदो मुखेऽपि) can be seen in Harlequin syndrome. [122] Parry-Romberg syndrome is characterized by atrophy of the skin and soft tissues of half of the face (hemifacial atrophy). Abnormal darkening of the skin (hyper pigmentation) overlying the affected areas (half of the face) (एवमेव वर्णभेदो मुखेऽपि) can also be seen in the patients of Parry-Romberg syndrome. [123] Infants with 'Horner syndrome' can demonstrate contralateral hemifacial flushing and ipsilateral hypohidrosis (एवमेव वर्णभेदो मुखेऽपि), called Harlequin syndrome. [124]

वर्णभेदेन ग्लानिहर्षरौक्ष्यस्नेहा व्याख्याताः।

Varna bhedhena ---- vyakhyaataa [*Verse* 10] [24]

हर्ष इहोपचयो ज्ञेयः।

Harsha iha upachayo gneyaha [*Chakrapani*, *Verse* 10] [24]

अर्धशरीरे ग्लानि & हर्षः - सव्यदक्षिण & उत्तराधरविभागेनः

(*Ardha shareere glani & harsha - Savya dakshina & Uttara adhara vibhaagena*):

Loss of muscle strength (ग्लानि) may be complete (paralysis, plegia) or incomplete (weakness, paresiss). Monoparesis or Monoplegia (only one extremity is

weak or paralyzed), Hemiparesis or Hemiplegia (one side of the body is weak or paralyzed) (अर्धशरीरे ग्लानि - सव्यदक्षिणविभागेन), Paraparesis or Paraplegia (weakness or paralysis of both legs) (अर्धशरीरे ग्लानि - उत्तराधरविभागेन), Quadriparesis or Quadriplegia (weakness or paralysis of all four extremities), and Diplegia (paralysis of like parts on the two sides of the body). [125] The most common presenting symptoms for ischemic stroke are difficulty with speech and weakness on one half of the body (अर्धशरीरे ग्लानि - सव्यदक्षिणविभागेन). [126] Hereditary spastic paraplegia (HSP) patients may present with progressive weakness in lower extremities (अर्धशरीरे ग्लानि - उत्तराधरविभागेन) and a slowly developing inability to walking. [127] CMV (Cytomegalovirus) polyradiculopathy is clinically characterized by lower extremity weakness (अर्धशरीरे ग्लानि - उत्तराधरविभागेन), urinary retention, and sacral dysesthesias. [128] The term myelopathy describes pathologic conditions that cause spinal cord, meningeal or perimeningeal space damage or dysfunction. Traumatic injuries, vascular diseases, infections and inflammatory or autoimmune processes may affect the spinal cord. Spinal cord injuries usually have devastating consequences such as quadriplegia, paraplegia (अर्धशरीरे ग्लानि - उत्तराधरविभागेन) and severe sensory deficits. Chronic myelopathies include spondylotic myelopathy, vascular malformations, retrovirus-associated myelopathy (HIV), syringomyelia, multiple sclerosis, combined subacute degeneration (vitamin B12 deficiency), tabes dorsalis, and familial spastic paraplegia (अर्धशरीरे ग्लानि - उत्तराधरविभागेन). [129]

मुखार्धे ग्लानि & हर्षः - सव्यदक्षिणविभागेन (*Mukhardhe glani & harsha - Savya dakshina vibhaagena*):

BP (Bell's Palsy) is the most common cause of unilateral facial paralysis and characterized by unilateral facial weakness (मुखार्धे ग्लानि - सव्यदक्षिणविभागेन). Weakness will be partial or complete to one-half of the face (मुखार्धे ग्लानि - सव्यदक्षिणविभागेन), resulting in weakness of the eyebrows, forehead, and angle of the mouth. Patients may present with an inability to close the affected eyelid or lip on the affected side. [130] Patients of 'Parry–Romberg syndrome' may present with unilateral progressive atrophy of one side of the face (मुखार्धे ग्लानि - सव्यदक्षिणविभागेन) along with unilateral involvement of the entire body (अर्धशरीरे ग्लानि - सव्यदक्षिणविभागेन). [131] The condition 'अर्धशरीरे & मुखार्धे हर्षः' denotes either normal half of the body or face which looks healthier when compared to the other half of the body or face which is affected by paresis or plegia or atrophy or wasting etc especially in the context of 'सव्यदक्षिणविभागेन' & 'उत्तराधरविभागेन'. 'अर्धशरीरे & मुखार्धे हर्षः', also indicates oedema or neoplastic growth of either side of the face or entire body. The pathological features 'ग्लानि' and 'हर्ष' both should be considered together in a same patient (as affected side represents 'ग्लानि' and the normal side represents 'हर्ष').

अर्धशरीरे & मुखार्धे स्निग्ध & रूक्ष - सव्यदक्षिण & उत्तराधरविभागेन (*Ardha shareere & Mukhaardhe Singdha & Rooksha - Savya dakshina & Uttara adhara vibhaagena*):

Sweat gland denervation results in skin dryness (रूक्ष) found in DAN (diabetic autonomic neuropathy). [132] Impaired neurogenic sweating indicates various autonomic neuropathies as well as neurodegenerative disorders. Sudomotor dysfunction can lead to either increased (स्निग्ध) or decreased sweating (रूक्ष) (hyper or anhidrosis) and it can occur both in central disorders affecting centres of sudomotor control such as acute ischemic stroke, multiple sclerosis and neurodegenerative syndromes as well as autonomic peripheral neuropathies such as diabetes, acute and chronic infections, primary or hereditary amyloidosis, paraneoplastic disorders such as Lambert–Eaton syndrome etc. [133] Hyperhidrosis, or excessive sweating (स्निग्ध), is a relatively common complaint in patients with spinal cord injury (SCI). Excessive intermittent left sided sweating (अर्धशरीरे स्निग्ध - सव्यदक्षिणविभागेन) was found in a patient of C4 complete tetraplegia. [134] Unilateral hyperhidrosis (अर्धशरीरे स्निग्ध - सव्यदक्षिणविभागेन) tends to be more common on the right side of the face or arm, with anhidrosis on the left side (अर्धशरीरे रूक्ष - सव्यदक्षिणविभागेन). [135] Patients with unilateral hyperhidrosis may present with excessive sweating on the right sides of the forehead, nose, and the palmar surface of the right hand (अर्धशरीरे स्निग्ध) with anhidrosis (absence of sweating) on the left hand (अर्धशरीरे रूक्ष). [136] Unilateral or circumscribed hyperhidrosis over right side of the chest (अर्धशरीरे स्निग्ध - सव्यदक्षिणविभागेन) has been found in a patient without any underlying pathology. [137] Seborrhoea (स्निग्ध) was found on the affected (paralyzed side) side in patients with facial paralysis (मुखार्धे स्निग्ध - सव्यदक्षिणविभागेन) and Ramsay-Hunt syndrome. [138] Studies have shown that the sebum excretion rate is greater (स्निग्ध) on the paralyzed side (मुखार्धे) of patients with facial paralysis (मुखार्धे स्निग्ध - सव्यदक्षिणविभागेन), and similarly, in paraplegic patients, below their neurological lesions (अर्धशरीरे स्निग्ध - उत्तराधरविभागेन). A greater reserve of lipids in the pilosebaceous ducts of paraplegic areas (अर्धशरीरे स्निग्ध - उत्तराधरविभागेन) have been found, which may be due to immobility and paralysis (Table 3). [139]

तथा पिप्लुव्यङ्गतिलकालकपिडकानामन्यतमस्याननेजन्मातुरस्यैवमेवाप्रशस्तं विद्यात्॥

Tathaa piplu vyanga ---- vidyaat [*Verse* 11] [24]

Sudden manifestation of '*Piplu'* (Acne), '*Vyanga'* (stains or discoloration), '*Tilakaalaka'* (mole or naevus) and '*Pidaka'* (papules or vesicles or blisters or other skin lesions) on the face denotes inauspiciousness. Morphea is the most common clinical form 'Scleroderma' or 'Systemic sclerosis' and it presents as a single or multiple plaque. These plaques are initially erythematous and then become sclerous, white, indurated, surrounded by a characteristic erythematous halo called "purple ring" (पिडका) reflecting its inflammatory activity. "Guttate" morphea or "white spot disease" refers to "drop-like" shaped areas of skin involvement. Linear scleroderma gives an aspect called "en coup de sabre" (cut from a sword) (राजयश्च पृथग्विधाः) on the scalp or face. [140] Various inflammatory (acute & chronic) dermatoses (पिडका), infectious dermatoses (bacterial - impetigo, cat scratch disease; fungal; viral - herpes simplex, zoster and chicken pox) (पिडका), autoimmune diseases (Systemic lupus erythematosus - SLE etc), bullous disorders [pemphigus, pemphigoid, dermatitis herpetiformis) (पिडका), premalignant epithelial lesions and nevi (melanocytic nevus (व्यङ्ग), dysplastic nevus (पिप्लु), actinic and seborrheic keratosis (पिप्लु or पिडका), keratocanthoma (पिप्लु or पिडका)], malignant epidermal tumours [basal cell carcinoma, squamous cell carcinoma and malignant melanoma (पिप्लु or पिडका or व्यङ्ग)] and other miscellaneous conditions like melasma, Sturge-Weber syndrome [port-wine stain or nevus flammeus which is in deep blue colour (व्यङ्ग) in some patients may develop as Sturge-Weber syndrome] etc are the commonest skin lesions. [141] Internal malignancies (अप्रशस्तम्) may leads to a number of cutaneous manifestations through their immunological, metabolic, and metastatic consequences. Flushing is seen in carcinoid syndrome. Skin acts like a mirror for various underlying diseases especially malignancies (अप्रशस्तम्). Skin manifestation may be sometimes the only symptom of underlying disease. [142] Melanoma is also of interest because it begins on the surface of the skin, is commonly associated with melanocytic nevi (moles) (तिलकालक), and is usually pigmented (Table 3). [143]

नखनयनवदनमूत्रपुरीषहस्तपादौष्ठादिष्वपि च वैकारिकोक्तानां वर्णानामन्यतमस्य प्रादुर्भावो हीनबलवर्णेन्द्रियेषु लक्षणमायुषः क्षयस्य भवति ॥

Nakha nayana --- kshayasya bhavati [*Verse* 12] [24]

Abnormal discoloration of nails, eyes, face, urine, faeces, hands, feet and lips etc in a cachexic or immunocompromised individual indicates imminent death (Table 3).

वैकारिक वर्णानाम् नखेषु (*Vaikarika varnaanaam nakheshu*):

Discoloration of nails (purple or blue or black) (श्याव, नील, and कृष्ण) along with atrophy denotes various underlying systemic diseases. Cyanosis may manifest as blue or purple discoloration of the nail bed and digits. Melanonychia (brown or black lines on nails) (श्याव & कृष्ण) may be due to an underlying melanocytic nevus or malignant melanoma, hemochromatosis, malnutrition, thyroid disease, smoking, HIV infection, and Addison's disease. [144] Vasoreactive individuals often have a perniotic circulation, especially at the hands and feet (acroperniosis). At rest, a perniotic circulation is characterized by a cold purplish (पक्वजाम्बववर्ण) periphery. [145]

वैकारिक वर्णानाम् नेत्रेषु (*Vaikarika varnaanaam netreshu*):

Blood shot eyes can be seen in various ophthalmological conditions like chemosis, inflammatory & allergic conditions, acute conjunctivitis, sub conjunctival haemorrhage and glaucoma etc; discoloration of eyes can be seen in conditions like Panda eye, jaundice, Heterochromia iridis, iris nevi, pigment dispersion syndrome, Horner's syndrome, Osteogenesis imperfect, Arcus senilis and Keyser Fleischer ring in Wilson's disease etc. [146]

वैकारिक वर्णानाम् वदनेषु (*Vaikarika varnaanaam vadaneshu*):

Various abnormal discolorations of face have been already discussed in previous sections.

वैकारिक वर्णानाम् मूत्रपुरीषस्य (*Vaikarika varnaanaam mutra purishasya*):

Yellow-Orange discoloration of urine is due to urochrome pigments. Green coloured urine in pseudomonas infections, brown colour urine is due to the presence of bile or faeces in urine, black coloured urine in melanoma, black water fever and alkaptonuria, purplish coloured urine in porphobilin, red coloured urine is due to the presence of haemoglobin and myoglobin and milky white coloured urine is due to the presence of chyle, pus and phosphates. [147] The normal colour of the stool is tawny due to the presence of bilirubin and bile. In infants, the stool may be green in colour. Clay-coloured or putty coloured stool is observed in biliary obstructions. Bleeding from the upper gastrointestinal system produces black, tarry stool. Red-coloured stool is observed in lower gastrointestinal tract bleeding. Stool colour can be evaluated by using a 'stool colour card'. [148]

वैकारिक वर्णानाम् हस्तपादौष्ठादिष्वपि (*Vaikarika varnaanaam hasta paada oshteshu*):

Acrocyanos is characterized by coolness and violaceous dusky discolorations of hands and the feet (हस्तपादौ). Other peripheral part like ear, nose, and lips (ओष्ठादिष्वपि) can also be affected. It is a functional peripheral vascular disorder (PVD) characterized by bluish discoloration of skin and mucous membrane due to diminished oxyhemoglobin. [98] Raynaud's

phenomenon is characterized by a triphasic colour change of the digits with initial white or pallor (ischemic phase), then blue or cyanosis (deoxygenation phase), followed by red or erythema (reperfusion phase). It is typically present in the hands but can also affect the toes (हस्तपादौ), nose, earlobes, or nipples. [149] Peripheral cyanosis is usually only seen in the upper and lower extremities (हस्तपादौ). [97] Central cyanosis is apparent at the lips (ओष्ठादिष्वपि). [150]

हीनबलवर्णेन्द्रियेषु लक्षणमायुषः क्षयस्य (*Heena balavarnendriyeshu lakshanamayusha kshayasya*):

'हीनबलवर्णेन्द्रियेषु लक्षणमायुषः क्षयस्य', denotes discoloration of skin seen in weak or cachexic or immunocompromised patients should be considered as inauspicious or a sign that indicates imminent death. Mottling (stasis, purplish discoloration of extremities) is one of the clinical sign and indicates imminent death seen in patients at the end-of-life stages (लक्षणमायुषः क्षयस्य). [151] 'Changes in skin colour' (skin becomes deadly pale or earth like colour and skin colour drains or turns white) is one of the signs and symptoms of impending death in end-of-life senile dementia patients (लक्षणमायुषः क्षयस्य). [152] Discoloration of skin, skin colour turns pale, jaundice or cyanotic and manifestation of skin lesions etc are seen in advanced cases of cancer (लक्षणमायुषः क्षयस्य). [153]

यश्चान्यदपि किंचिद्वर्णवैकृतमभूतपूर्वं सहसोत्पद्येतानिमित्तमेव हीयमानस्यातुरस्य शश्वत् तदरिष्टमिति विद्यात् इति वर्णाधिकारः॥

Yascha anyaadapi kinchit ---- varnaadhikaaraha [*Verse* 13] [24]

सहसोत्पद्यत इत्यनेन रिष्टानां शीघ्रस्वभावं दर्शयति।

Sahasotpadyata ---- darshayati [*Chakrapani, Verse* 13] [24]

The acronym ALTE (Apparent Life-Threatening Event) is widely used in medical literature, sometimes particularly referring to acute (सहसोत्पद्यत) and severe events (Acute Life-Threatening Episodes or Events). BRUE (Brief Resolved Unexplained Events) denote patients who come under medical observation without any symptomatology and with a clinical history that suggests minor episodes. Cyanosis or Pallor (किंचिद्वर्णवैकृतम्) is one of the symptoms comes under the domain of BRUE. In approximately 15% of the total cases, there is no known causative factor or specific etiology (अभूतपूर्वम!) which can be termed as 'idiopathic ALTE (IALTE)'. [154] Though ALTE and BRUE are related to pediatric practice, they can be generalized to understand various conditions seen in other medical specialities also. Sudden or abrupt changes in skin colour (pallor or cyanosis or erythrosis) without having any apparent cause or specific etiology denotes ALTE or BRUE. Various conditions discussed in previous sections regarding skin discoloration represent the above verse (Table 3).

स्वराधिकारस्तु हंसक्रौञ्चनेमिदुन्दुभिकलविङ्ककाककपोतजर्जरानुकाराः प्रकृतिस्वरा भवन्ति। यांश्चापरानुपेक्षमाणोऽपि विद्यादनूकतोऽन्यथा वाऽपि निर्दिश्यमानांस्तञ्ज्ञैः। एडककलग्रस्ताव्यक्तगद्गदक्षामदीनानुकीर्णास्त्वातुराणां स्वरा वैकारिका भवन्ति। यांश्चापरानुपेक्षमाणोऽपि विद्यात् प्राग्विकृतानभूत्वोत्पन्नान्। इति प्रकृतिविकृति स्वरा व्याख्याता भवन्ति॥

Swaraadhikaarastu ---- bhavanti [*Verse* 14] [24]

जर्जरः वाद्यभाण्डविशेषः। एडको मेषः किंवा अरण्यच्छागलः। कलः सूक्ष्मः। ग्रस्तः सर्वथाऽनुच्चारः। क्षामः रूक्षः। दीनः दुःखोच्चार्यमाणस्वरः। अनुकीर्ण उपयुपर्युच्चार्यमाणः।

Jarjaraha ---- ucchharyamaanaha [*Chakrapani, Verse* 13] [24]

The normal human voice (प्रकृतिस्वरा) resembles with the voices of various birds and instruments like हंस (goose or swan), क्रौञ्च (curlew-like), नेमि (tyres or wheel), दुन्दुभि (kettle drum), कलविङ्क (sparrow or Indian cuckoo), काक (crow), कपोत (dove), and जर्जर (a type of drum produces sounds like splashing or dropping) etc. The voices or sounds like एडक (sheep), कल (feeble), ग्रस्त (inaudible), अव्यक्त (indistinct), गद्गद (chocked), क्षाम (hoarse or rough), दीन (difficulty or painful), and अनुकीर्ण (stuttering or stammering) etc. are considered as abnormal or pathological voices which are inauspicious and indicates imminent death (Table 4).

Voice assessment or analysis:

"Voice" is the sound that the listener perceives when the adducted vocal folds are driven into vibration by the pulmonary air stream. There four most common approaches to assess various aspects of voice production (auditory perceptual, acoustic, aerodynami, and endoscopic imaging assessments). Auditory-Perceptual Evaluation of Voice (CAPE-V) is one of the tools for clinical assessment of voice quality. It provides a standardized framework and procedures for perceptual evaluation of abnormal voice quality and visual analog scaling of a closed set of perceptual vocal attributes such as overall severity of dysphonia, breathiness, roughness, straining, pitch and loudness. [155] Quantified measures of vocal function are required for the patient, clinician and local voice units to measure outcomes following treatments for voice disorders. A standardized protocol for assessment of voice is also required to assess and compare voice treatments. The Multi-Dimensional Voice Programme acoustic analysis system (MDVP, KayPentax, USA) is a voice analysis software package widely used in voice clinics and OperaVOX (On PErson RApid VOice eXaminer, Oxford Research Wave Ltd, UK) is a portable voice analysis software package designed for use with iOS devices. [156] The GRBAS scale (is a four-point ordinal scale containing five well-defined parameters: Grade, Roughness, Breathiness, Aesthenia

and Strain) developed by the Japan Society of Logopaedics and Phoniatrics. [157] The study of voice quality perception typically requires acoustic recordings of voice samples for analysis. Voice includes aspects of articulation (breathiness) and accent, unvoiced portions of utterances, sentential prosody, gestures related to linguistic voicing contrasts, and so on. [158] PRO (patient reported outcomes) measures are also a principal means of evaluating treatment effectiveness in voice-related conditions. [159] Voiceprint identification is a biometric technique that identifies the speaker through voiceprint features. Trained with a large number of voice data, the voiceprint identification model can automatically learn a wide range of acoustic features (spectrum, pitch, formant, etc.), which greatly improves the accuracy of voiceprint recognition. [160]

Voice disorders:

Voice disorders are the most common speech and language disorders. Various factors are involved in the development of dysphonia and hoarseness such as organic (vocal cord malformations, traumatic, inflammatory, infectious, and neoplastic), neurologic (innervation and muscular control of the vocalization system), and functional causes (psychogenic or hypo or hyper functional). [161] Various conditions such as vocal cord polyps and nodules, acute corditis vocalis, acute epiglottitis, recurrent nerve paralysis, laryngeal cancer, Reinke's edema, vocal cord atrophy, sulcus vocalis, laryngeal granuloma, functional aphonia, spasmodic dysphonia, dysphonia plicae ventricularis, hypotonic voice disorders, mutational voice disorders, and essential tremors etc can cause voice disorders. [162] Voice disorders or dysphonia are characterized by, 'Roughness or hoarsenes' (lack of clear vocal quality) (क्षाम), 'Breathiness' (excessive air escape during phonation) (गद्गद ?), 'Strain' (perception of excessive vocal effort or hyperfunction) (दीन or अनुकीर्ण), 'Consistent hard glottal attacks', 'Aphonia' (intermittent or consistent absence of voicing) (अव्यक्त), 'Pitch' (too high or too low) (ग्रस्त), 'Loudness' (too loud or too soft) (कल) and 'Variability' (excessive or reduced or monotonous variation in pitch and loudness) etc pathological features. [163] Various 'विकृत स्वराः' mentioned in the above verse denotes different underlying pathological conditions (Table 4). [164]

तत्र प्रकृतिवैकारिकाणां स्वराणामाश्वभिनिर्वृत्तिः स्वरानेकत्वमेकस्य चानेकत्वमप्रशस्तम्।

इति वर्णस्वराधिकारौ यथावदुक्तौ मुमूर्षतां लक्षणज्ञानार्थमिति ॥

Tatra prakruti --- gnaanaardhamiti [*Verse* 15&16] [24]

Sudden or abrupt change of voice denotes inauspiciousness and also imminent death. Transient speech disturbance (आशु अभिनिर्वृत्तिः) is a challenging symptom for TIA (transient ischemic attack) diagnosis. Isolated complete and brief speech arrest, particularly if recurrent and stereotyped, is probably more commonly related to seizures than TIA. Motor or speech disturbances can be seen in 'Migraine Aura'. Recurrent stereotyped episodes of slurred speech can be seen in Multiple sclerosis. [165] 'Flaccid' and ''Nasal' LMN (lower motor neuron) quality of speech (वैकारिकाणां स्वराणाम्) is seen in MG (myasthenia gravis) and 'Strangled' speech quality (वैकारिकाणां स्वराणाम्) can be seen in ALS (amyotrophic lateral sclerosis) with a combination of spastic and flaccid qualities. [166] Most cancer patients with ischemic stroke present with hemiparesis (मुमूर्षताम्) with speech disturbances voice (वैकारिकाणां स्वराणाम्). [167] Patients with UVCP (unilateral vocal cord palsy) will present with a sudden onset (आशु अभिनिर्वृत्तिः) of dysphonia, characterized by a weak or "breathy" voice (वैकारिकाणां स्वराणाम्). Malignancy (मुमूर्षताम्) is the most common cause of UVCP and is seen in primary and metastatic lung and laryngeal carcinoma, thyroid and central nervous system (CNS) cancers. [168] Dysphonia (वैकारिकाणां स्वराणाम्) is defined as voice disorders like speech impairment or difficulty (hoarseness, weakness or even loss of voice). Sometimes dysphonia may be the first symptom seen in the neoplasm of the larynx, pharynx, lungs, thyroid and lymphoma (मुमूर्षताम्). Mediastinal metastases from the breast, lungs or other cancers (मुमूर्षताम्) of the body can press on laryngeal nerves. Dysphonia (वैकारिकाणां स्वराणाम्) in an immunosuppressed patient (बलविहीनस्य) denotes chronic lymphoproliferation. [169] Unexplained weight loss, immunosuppression (बलमांसविहीनस्य) with hoarseness of voice (स्वर वैकृतौ) denotes serious underlying disease such as carcinoma (मुमूर्षताम्). [170]

Summary of the whole chapter:

यस्य वैकारिको वर्णः शरीर उपपद्यते। अर्धे वा यदि वा कृत्स्ने निमित्तं न च नास्ति सः॥
नीलं वा यदि वा श्यावं ताम्रं वा यदि वाऽरुणम्। मुखार्धमन्यथा वर्णो मुखार्धेऽरिष्टमुच्यते॥
स्नेहो मुखार्धे सुव्यक्तो रौक्ष्यमर्धमुखे भृशम्। ग्लानिरर्धे तथा हर्षो मुखार्धे प्रेतलक्षणम्॥
तिलकाः पिप्लवो व्यङ्गा राजयश्च पृथग्विधाः। आतुरस्याशु जायन्ते मुखे प्राणान् मुमुक्षतः॥
पुष्पाणि नखदन्तेषु पङ्को वा दन्तसंश्रितः। चूर्णको वाऽपि दन्तेषु लक्षणं मरणस्य तत्॥
ओष्ठयोः पादयोः पाण्योरक्ष्णोर्मूत्रपुरीषयोः। नखेष्वपि च वैवर्ण्यमेतत् क्षीणबलेऽन्तकृत्॥
यस्य नीलावुभावोष्ठौ पक्वजाम्बवसन्निभौ। मुमूर्षुरिति तं विद्यान्नरो धीरो गतायुषम्॥
एको वा यदि वाऽनेको यस्य वैकारिकः स्वरः। सहसोत्पद्यते जन्तोर्हीयमानस्य नास्ति सः॥
यच्चान्यदपि किञ्चित् स्याद्विकृतम् स्वरवर्णयोः। बलमांसविहीनस्य तत् सर्वं मरणोदयम्॥
इति वर्णस्वरावुक्तौ लक्षणार्थे मुमूर्षताम्। यस्तौ सम्यग्विजानाति नायुज्ञानि स मुह्यति॥

Yasya vaikariko ---- sa muhyati [*Verse* 17-26] [24]

The above text represents the brief summary of the whole chapter. Exploration of the above verses has been done in previous sections (Table 3 & 4).

CONCLUSION:

Definition and scope of '*Indriya sthana'* has been explained in this chapter. Standardization of various

prognostic factors '*Varna'*, '*Swara'*, '*Bhakti'*, and '*Sattva'* etc and also scales, questionnaires, instruments, software and models etc needs to be developed based on these parameters. Factors related to formation and development of human personality has been quoted with wonderful example (*Shoucham*). *'Lakshana nimitta arishta lakshanas'* denote idiopathic or genetic or congenital anomalies; '*Lakshya nimitta arishta lakshanas'* denote signs and symptoms produced by a primary disease and '*Nimittanurupa arishta lakshanas*' denote secondary disease. Physiological & pathological skin complexions, normal voices and voice disorders have been mentioned with examples. Standardization of the voices and skin colours (both normal and abnormal) mentioned in this chapter is required. Various research designs such as longitudinal, cross-sectional, longitudinal sequential, prospective and retrospective cohort, survey, case study or case reports, animal experimentations, development and standardization etc are required to substantiate the opinions or clinical experiences mentioned in this chapter in terms of their validity, reliability, generalizability and clinical applicability in contemporary medical practice.

Table 1: Ayurvedic prognostic factors and relevant measuring tools

Ayurvedic prognostic factors	Relevant measuring scales / questionnaires / instruments
वर्ण (*Varna*)	Fitzpatrick skin type scale, Reflectance spectroscopy, Minolta chromameter, Mexameter (using erythematic and melanin indices), C.L.B.T assessment;
स्वर (*Swara*)	Linear analog scale of assessment - voice quality (LASA-VQ), Vocal performance questionnaire (VPQ), Vocal tract discomfort (VTD), Evaluating voice disability - Quality of life questionnaire (EVD-QOL), Speech disability questionnaire (SDQ), Voice handicap index (VHI), Voice symptom questionnaire (VSQ), Vocal fatigue index (VFI) etc;
गन्ध (*Gandha*)	Odour fingerprints, Odour signatures, E-nose, *Byoshu*, Gas chromatography, Gas chromatography with mass spectrometry etc;
रस (*Rasa*)	Biomarkers, Measuring various blood components, Breathalyser, VOCs (volatile organic compounds) etc;
स्पर्श (*Sparsha*)	Thermography, Tenderness grading scale, Virtual palpation on 3D computer models, Elastography etc;
चक्षुश्च श्रोत्रं घ्राणं रसनं स्पर्शनम् (*Chakshu, Shrotra, Ghraana, Rasana & Sparshana*)	Sensory over-responsivity scale (sensOR), Multi-Modality unusual sensory experiences questionnaire (MUSEQ), The Launay slade hallucination scale (LSHS), Cardiff anomalous perception scale (CAPS), Osteba critical appraisal cards, Sensory integration and Praxis test, The sensory profile, Perceived stress scale (PSS) etc;
सत्वम् (*Sattvam*)	Mental health quality of life, The satisfaction with life scale (SWLS), Scale of self esteem (Rosenberg scale), Quality of life index for mental health, Quality of wellbeing scale, Mini mental status examination (MMSE) etc;
भक्ति (*Bhakti*)	The mood, interest and pleasure questionnaire (MIPQ), Strong interest inventory test etc;
शौचम् (*Shaucham*)	Hygiene behaviour scale (HBS), Hand washing behaviour scale Terms of planned behaviour model, Yale-Brown obsessive compulsive scale (Y-BOCS), Cleaning and Hygiene scale etc;
शीलम् (*Sheelam*)	Philadelphia geriatric centre morale scales, The big five personality test (BFPT), The traits personality questionnaire 5 (TPQue5), Rorschach ink blot technique, Minnesota multiphasic personality inventory, Eysenck personality inventory, Maudsley personality questionnaire etc;
आचार (*Achaara*)	Behaviour and symptom identification scale (BASIS), Client adjustment rating scale, Social behaviour assessment schedule, Social maladjustment schedule etc;
स्मृति (*Smriti*)	Addenbrookes cognitive assessment - Revised (ACE-R), Abbreviated mental test score (AMTS), General practitioner assessment of cognition (GPCOG), Memory impairment screen (MIS), Montreal cognitive assessment (MoCA), PGI memory scale, Test your memory (TYM) etc;
आकृति (*Akriti*)	Anthropometric measurements like height, weight, circumference, skin fold thickness and several other measurements;
प्रकृति (*Prakruti*)	Prototype *Prakriti* Analysis tool (PPAT), AyuSoft *Prakriti* software, *Ayurveda* child personality inventory (ACPI), Mysore *tridosha* scale etc;
विकृति / व्याधि (*Vyadhi*)	Computerized adaptive assessment of disease impact (DICAT), Quality of life disease impact scale (QDIS), Multi group confirmatory factor analysis (MGCFA), Item response theory (IRT), Disease specific quality of life scales (QOLs) etc;
बलम् (*Balam*)	Modifiable activity questionnaire (MAQ), Previous week modifiable activity questionnaire (PWMAQ), Recent physical activity questionnaire (RPAQ), International physical activity questionnaire (IPAQ), 7 day physical activity recall (PAR) etc;
ग्लानि (*Glaani*)	Fatigue severity scale, Fatigue questionnaire, Multidimensional fatigue inventory, Fatigue impact scale, Visual analogue scale - Fatigue etc;

मेधा (*Medha*)	Classification of intellectual and other psychological impairments functioning, Mental residual functional capacity assessment (MRFC), Wechsler adult intelligence scale (WAIS-IV), Boston naming test, Controlled oral word association, Hopkins verbal learning test - Revisited;
हर्ष (*Harsha*)	Affect balance scale, General well being index, The positive and negative syndrome scale (PANSS), Quality of life enjoyment and satisfaction questionnaire etc;
रौक्ष्य (*Raukshya*)	Surface characterizing impedance monitor (SCIM), Nova Dermal Phase Meter etc;
स्नेह (*Senha*)	Moisture Map, Dermaflex, Biospec imager, SkinChip, Skicon, Corneometer, Dermal Torque Meter, Twistometer etc;
तन्द्रा (*Tandra*)	Pittsburgh sleep quality index (PSQI), Holland sleep disorder questionnaire (HSDQ), Gorningen sleep quality scale (GSQS), Karolinska sleepiness scale (KSS), Expanded consensus sleep diary (CSD-E) etc;
आरम्भ (*Aarambha*)	Various screening tests like Mini-Cog, 6-CIT, The informant questionnaire on cognitive decline in the elderly (IQCODE), Geriatric depression screening scale, The Hospital anxiety and depression scale etc;
गौरवं च लाघवं च (*Gaurava & Laghava*)	Increased or decreased specific gravity of sputum, semen, urine and faeces etc which can be measured by laboratory investigations like sputum, semen, urine analysis;
आहारगुणश्च (*Aahara guna*)	Diet satisfaction questionnaire (DSat-45), RESIDE dietary guideline index (RDGI), Food frequency questionnaire (FFQ), Dietary behaviour questions (DBQ) etc;
विहार (*Vihaara*)	Simple lifestyle indicator questionnaire (SLIQ), The healthy lifestyle and personal control questionnaire (HLPCQ), Lifestyle questionnaire related to cancer, Health protective behaviour scale etc;
आहारपरिणाम (*Aahaara parinaama*)	Questionnaire to assess *Jatharagni*, Self assessment tool to estimate *Agnibala*, VAS scales, Metabolic markers etc;
व्याधिपूर्वरूपम् (*Vyadhi purvarupa*)	Severity scales, screening instruments or questionnaires, VAS (visual analogue scales) etc;
वेदना (*Vedana*)	Oswestry disability index (ODI), Roland & Morris disability questionnaire, VAS, Graphic rating scale (GRS), Numerical rating scale (NRS), Verbal rating scale (VRS), McGill pain questionnaire (MPQ), Pain-O-Meter etc;
उपद्रवानि (*Upadrava*)	Patient reported outcome measures (PROM), Patient reported experience measures (PREM), EQ-5D, EQ-VAS etc;
च्छायाश्च प्रतिच्छाया च (*Cchhaya & Praticchhaya*)	Red reflex test, Radio diagnosis & imaging, Kirlian photography, Fitzpatrick skin type scale, C.L.B.T assessment, Computerized analysis of shadows, studies on cast shadows etc;
स्वप्नदर्शनम् (*Swapna darshana*)	Nightmare distress questionnaire (NDQ), Beliefs about dream questionnaire (BADQ), Chinese version of Van Dream anxiety scale (CVDAS), Dream survey questionnaire (DSQ) etc;
दूताधिकारः (*Dootadhikara*)	Caregiver strain index (CSI), Zarit burden interview, Care related quality of life, Burden scale for family caregivers, Care giving knowledge questionnaire (CKQ-My), Caregiver burden scale - Indian population (CBS-IP), Caregiver confidence in sign/symptom management scale (CCSM), Revised scale of care giving self efficacy (RSSE), Self efficacy questionnaire for Chinese family caregivers (SEQCFC) etc;

Table 2: *Prakruta Varnas* according to 'Fitzpatrick classification of skin types'

Prakruta varna	Skin colour	Fitzpatrick skin type
कृष्णाः (*Krishna*)	Black	Type VI
श्यामः (*Shyaama*)	Brown	Type V
श्यामावदातः (*Shyaamavadaata*)	Light brown	Type III & Type IV
अवदात or गौरः (*Avadaata* or *Gaura*)	Fair or White	Type I & Type II

Table 3: *Arishta Lakshanas* related to '*Varna*'

Arishta lakshana	Relevant disease or pathology
नीलश्यावताम्रहरितशुक्लाश्च वर्णाः ---- भवन्त्युक्ताः शरीरस्य (Ch. I. 1 / 9) *Neela --- Shareerasya*	Cyanosis; Melasma; Addison's disease; Post-inflammatory hyper pigmentation; Cutaneous amyloidosis; Acanthosis nigricans; Wilson's disease; Purpura; Fungal infections in immunocompromised patients; Jaundice; Hepatocellular carcinoma; Pallor; Hypomelanosis or hypopigmentation; Vitiligo;

विकृतिवर्णमर्धशरीरे ---- सव्यदक्षिणविभागेन (Ch. I. 1 / 10) *Vikruti --- Vibhaagena*	Harlequin colour change;
विकृतिवर्णमर्धशरीरे ---- उत्तराधरविभागेन (Ch. I. 1 / 10) *Vikruti --- Vibhaagena*	Differential cyanosis; Reverse differential cyanosis; Spinal cord injury (SCI); Paraplegia;
विकृतिवर्णमर्धशरीरे ---- पूर्वपश्चिमविभागेन (Ch. I. 1 / 10) *Vikruti --- Vibhaagena*	Discoloration of dorsal or posterior surface of the body due to venous stasis in chronic bed ridden patients;
विकृतिवर्णमर्धशरीरे ---- अन्तर्बहिर्विभागेन (Ch. I. 1 / 10) *Vikruti --- Vibhaagena*	Acquired generalized hyper pigmentations due to various underlying conditions; Oral pigmentation; Sino-nasal melanosis; Nevus of Ota;
वर्णभेदो मुखार्धेऽपि (Ch. I. 1 / 10) *Varna bhedho -- api*	Unilateral facial flushing in Harlequin syndrome; Horner's syndrome; Parry-Romberg syndrome;
अर्धशरीरे ग्लानि & हर्षः - सव्यदक्षिण & उत्तराधरविभागेन (Ch. I. 1 / 10) *Ardha shareere --- vibhaagena*	Hemiplegia or hemiparesisi; Paraplegia or paraparesis; Diplegia; HSP (Hereditary spastic paraplegia); CMV (cytomegalovirus) polyradiculopathy; SCI; Myelopathies;
मुखार्धे ग्लानि & हर्षः - सव्यदक्षिण विभागेनः (Ch. I. 1 / 10) *Mukhaardhe --- vibhaagena*	DAN (Diabetic autonomic neuropathy); Anhidrosis & Hyperhidrosis; SCI; Cervical spine pathology; Unilateral facial seborrhoea in Ramsay-Hunt syndrome & Facial paralysis;
अर्धशरीरे स्निग्ध & रूक्षः - उत्तराधर विभागेन (Ch. I. 1 / 10) *Ardha shareere --- vibhaagena*	Paraplegia; SCI; Myelopathy;
पिप्लुव्यङ्गतिलकालकपिडकानामन्यतमस्याननेे (Ch. I. 1 / 11) *Piplu vyanga --- anane*	Basal cell carcinoma; Squamous cell carcinoma; Scleroderma; SLE (Systemic lupus erythematosus); Inflammatory & Infectious dermatoses; Sturge-Weber syndrome; Fungal & Viral skin infections; Melanocytic nevi; Hyper pigmentations; Carcinoid syndrome;
नखनयनवदनमूत्रपुरीषहस्तपादौष्ठादिष्वपि ----- क्षयस्य भवति (Ch. I. 1 / 12) *Nakha nayana ---- bhavati*	Cyanosis; Melanonychia; Acroperniosis; Chemosis; Jaundice; Panda eye; Iris nevi; Horner's syndrome; Melanoma; Alkaptonuria; Black water fever; Biliary obstruction; Upper and lower gastrointestinal bleeding; Peripheral vascular disease (PVD); Acrocyanosis; Raynaud's phenomenon; Mottling at end-of-life stages;
यश्चान्यदपि किंचिद्वर्णवैकृतमभूतपूर्वम् ---- इति वर्णाधिकारः (Ch. I. 1 / 13) *Yascha --- varnaadhikaaraha*	Cyanosis, Pallor and Erythrosis seen in ALTE (Apparent Life-Threatening Events) & BRUE (Brief Resolved Unexplained Events);

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number;

Table 4: *Arishta Lakshanas* related to '*Swara*'

Arishta lakshana	Relevant disease or pathology
एडक (Hoarseness or raspyness) (Ch. I. 1 / 14)	Due to structural changes of vocal cords (Acute or chronic laryngitis, Polyps etc);
कल (Feeble) (Ch. I. 1 / 14)	Aphonic palilalia; Hypophonia; Paresis of vocal cords; LMN (lower motor neuron) lesions;
ग्रस्त (Inaudible) (Ch. I. 1 / 14)	Aphonia; Hypophonia; LMN (lower motor neuron) lesions; ALS (Amyotrophic lateral sclerosis); MG (Myasthenia gravis); TIA (Transient ischemic attack) etc;
अव्यक्त (Indistinguishable) (Ch. I. 1 / 14)	Aphonia; Aphonic palilalia; Progressive supranuclear palsy; Bilateral upper brainstem lesions;
गद्गद (Chocked or stammering) (Ch. I. 1 / 14)	Spastic or Spasmodic dysphonia; Dysarthria (bilateral cerebral lesions, cerebral glioma of parietal origin etc);
क्षाम (Hoarse or rough) (Ch. I. 1 / 14)	Hyperkinetic dysarthria; Structural lesions and inflammatory conditions of larynx;
दीन (Difficulty or painful) (Ch. I. 1 / 14)	Dysphasia; Dysphonia; Motor or Broca's Aphasia; Inflammatory lesions of the pharynx and larynx; Neoplasms of larynx, pharynx, lungs, and thyroid; Lymphoma; Mediastinal metastases pressing laryngeal nerves; Unilateral vocal cord palsy (UVCP) etc;
अनुकीर्ण (Stuttering or stammering) (Ch. I. 1 / 14)	Spastic paralysis; Dysarthria; Rigidity; Spasms of muscles of articulation;
तत्र प्रकृतिवैकारिकाणाम् ---- चानेकत्वमप्रशस्तम् (Ch. I. 1 / 15) *Tatra --- aprashastam*	Migraine Aura; TIA; MG; ALS; LMN lesions; UVCP; Multiple sclerosis (MS); Epilepsy; Carcinomas of larynx, pharynx, lungs, and thyroid; Lymphoma; Mediastinal metastasis; Cancer cachexia etc;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number;

REFERENCES:

1. Bagde AB et al. Charaka samhita - Complete Encyclopaedia of Ayurvedic sciences. Int J Ayu Alt Med 2013; 1 (1): 12-20.
2. Mayur NS, Bharat C, Namrata C, Bhushan M. Relevance of indriyasthan in the prognosis of diseases: A review. Int. J. Res. Ayurveda Pharm. 2018; 9 (1): 9-12. http://dx.doi.org/10.7897/2277-4343.0913
3. Anurag V, Shreyasi B. Indriya sthana of Charaka samhita: A review. The Pharma Innovation Journal 2020; 9 (3): 13-16. Available from: http://www.thepharmajournal.com/archives/2020/vol9issue3/PartA/9-2-94-642.pdf
4. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, Hindi commentary by Kasinatha Sastri & Gorakhanatha Chaturvedi (Vol-1) (11th ed). Sutra sthana - 10th chapter: Maha chatushpada adhyayam. Varanasi: Chaukhamba bharati academy; 1983. p. 203.
5. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Sutra sthana - 10th chapter: Maha chatushpada adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 65-66.
6. Gill TM. The central role of prognosis in clinical decision making. JAMA. 2012; 307 (2): 199-200. doi: 10.1001/jama.2011.1992. PMID: 22235093; PMCID: PMC3273781.
7. Hui D. Prognostication of Survival in Patients with Advanced Cancer: Predicting the Unpredictable? Cancer Control. 2015; 22 (4): 489-497. doi: 10.1177/107327481502200415. PMID: 26678976; PMCID: PMC4769860.
8. Smith AK, White DB, Arnold RM. Uncertainty--the other side of prognosis. N Engl J Med. 2013; 368 (26): 2448-2450. doi: 10.1056/NEJMp1303295. PMID: 23802514; PMCID: PMC3760713.
9. Cruz-Oliver DM. Palliative Care: An Update. Mo Med. 2017; 114 (2): 110-115. PMID: 30228556; PMCID: PMC6140030.
10. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 7th chapter: Panna rupeeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 366.
11. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 8th chapter: Avaak shiraseeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 367.
12. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 2nd chapter: Pushpitakam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 357.
13. Leal J, Gray AM, Clarke PM. Development of life-expectancy tables for people with type 2 diabetes. Eur Heart J. 2009; 30 (7): 834-839. doi: 10.1093/eurheartj/ehn567. PMID: 19109355; PMCID: PMC2663724.
14. Institute of Medicine (US) Committee on Palliative and End-of-Life Care for Children and Their Families; Field MJ, Behrman RE, editors. When Children Die: Improving Palliative and End-of-Life Care for Children and Their Families. Washington (DC): National Academies Press (US); 2003. Appedix B, Prognostication scores. Available from: https://www.ncbi.nlm.nih.gov/books/NBK220810/
15. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 5th chapter: Poorva rupeeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 363.
16. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 3rd chapter: Parimarshaneeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 359.
17. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 11th chapter: Anu jyoteeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 370-371.
18. Smith JL. Why do physicians overestimate life expectancy of a person who is terminally ill: Commentary. West J Med. 2000; 172 (5): 313-314. doi: 10.1136/ewjm.172.5.313. PMID: 18751283; PMCID: PMC1070877.
19. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 6th chapter: Katamani shareeriyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 364.
20. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 4th chapter: Indriyaneekam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 360.
21. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 10th chapter: Sadyo maraneeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 369.
22. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 9th chapter: Yasya shyaava nimitteeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 368.
23. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 12th chapter: Gomaya choorneeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 371.
24. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 1st chapter: Varna swareeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 353-356.
25. Epstein AS, Prigerson HG, O'Reilly EM, Maciejewski PK. Discussions of Life Expectancy and Changes in Illness Understanding in Patients with Advanced Cancer. J Clin Oncol. 2016; 34 (20): 2398-2403. doi: 10.1200/JCO.2015.63.6696. PMID: 27217454; PMCID: PMC4981977.
26. Sachdeva S. Fitzpatric skin typing: Applications in dermatology. Indian J Dermatol Venereol Leprol. 2009; 75: 93-96.
27. Treesirichod A, Chansakulporn S, Wattanapan P. Correlation between skin color evaluation by skin color scale chart and narrowband reflectance spectrophotometer. Indian J Dermatol. 2014; 59 (4): 339-342. doi: 10.4103/0019-5154.135476. PMID: 25071249; PMCID: PMC4103266.
28. Musnier C, Piquemal P, Beau P, Pittet JC. Visual evaluation in vivo of 'complexion radiance' using the C.L.B.T. sensory methodology. Skin Res Technol. 2004; 10 (1): 50–56.
29. Francis DO, Daniero JJ, Hovis KL, Sathe N, Jacobson B, Penson DF, Feurer ID, McPheeters ML. Voice-Related Patient-Reported Outcome Measures: A Systematic Review of Instrument Development and Validation. J Speech Lang Hear Res. 2017; 60 (1): 62-88. doi: 10.1044/2016_JSLHR-S-16-0022. PMID: 28030869; PMCID: PMC5533561.
30. Lenochova P, Havlicek J. Chemical Signals in Vertebrates 11. Chapter-18 - Human body odour individuality. New York: Springer; 2008, p. 189-198. https://doi.org/10.1007/978-0-387-73945-8_18
31. Havlíček J, Fialová J, Roberts SC. Springer handbook of odor. Chapter-50 - Individual variation in body odor. Cham: Springer; 2017, p. 949-961. https://doi.org/10.1007/978-3-319-26932-0_50
32. Shirasu M, Touhara K. The scent of disease: volatile organic compounds of the human body related to disease and disorder. J. Biochem. 2011; 150 (3): 257-266. doi:10.1093/jb/mvr090

33. Kusuhara M, Urakami K, Zangiacomi V, Hoshino K. Disease and smell: "Byoshu". Anti-Aging Medicine. 2010; 7 (6): 66-72. doi: 10.3793/jaam.7.66
34. Wongchoosuk C, Lutz M, Kerdcharoen T. Detection and classification of human body odor using an electronic nose. Sensors. 2009; 9 (9): 7234-7249. doi:10.3390/s90907234
35. Bagavathiappan S, Saravanan T, Philip J, Jayakumar T, Raj B, Karunanithi R, Panicker TM, Korath MP, Jagadeesan K. Infrared thermal imaging for detection of peripheral vascular disorders. J Med Phys. 2009; 34 (1): 43-47. doi: 10.4103/0971-6203.48720. PMID: 20126565; PMCID: PMC2804148.
36. Hubbard DR. Myofascial trigger points show spontaneous needle EMG activity. Spine 1993; 18 (13): 1803–1807.
37. Sarvazyan A, Hall TJ, Urban MW, Fatemi M, Aglyamov SR, Garra BS. An overview of elastography - An emerging branch of medical imaging. Curr Med Imaging Rev. 2011; 7 (4): 255-282. doi: 10.2174/157340511798038684. PMID: 22308105; PMCID: PMC3269947.
38. Temkin B, Acosta E, Hatfield P, Onal E, Tong A. Web-based three-dimensional Virtual Body Structures: W3D-VBS. J Am Med Inform Assoc. 2002; 9 (5): 425-436. doi: 10.1197/jamia.m1106. PMID: 12223495; PMCID: PMC346630.
39. Mitchell CAA, Maybery MT, Russell-Smith SN, Collerton D, Gignac GE and Waters F. The Structure and Measurement of Unusual Sensory Experiences in Different Modalities: The Multi-Modality Unusual Sensory Experiences Questionnaire (MUSEQ). Front. Psychol. 2017; 8:1363. doi: 10.3389/fpsyg.2017.01363
40. Schoen SA, Miller LJ, Green KE. Pilot study of the Sensory Over-Responsivity Scales: Assessment and inventory. Am J Occup Ther 2008; 62: 393–406.
41. Jorquera-Cabrera S, Romero-Ayuso D, Rodriguez-Gil G, Triviño-Juárez JM. Assessment of Sensory Processing Characteristics in Children between 3 and 11 Years Old: A Systematic Review. Front Pediatr. 2017; 5: 57. doi: 10.3389/fped.2017.00057. Erratum in: Front Pediatr. 2017; 5: 266. PMID: 28424762; PMCID: PMC5371598.
42. de Oliveira MF, Castro RC, Calou CG, de Oliveira MF, de Souza Aquino P, da Silva CG, Meireles CB, Maia LC, Miná VA, Faé BN, Santos MF. Ways to Measuring Quality of Life in Mental Health. Int Arch Med. 2015; 8: 91. doi: 10.3823/1690
43. Linton MJ, Dieppe P, Medina-Lara A. Review of 99 self-report measures for assessing well-being in adults: exploring dimensions of well-being and developments over time. BMJ Open 2016; 6 (7): e010641. doi: 10.1136/bmjopen-2015-010641. PMID: 27388349; PMCID: PMC4947747.
44. Lindert J, Bain PA, Kubzansky LD, Stein C. Well-being measurement and the WHO health policy Health 2010: systematic review of measurement scales. Eur J Public Health. 2015; 25 (4): 731-740. https://doi.org/10.1093/eurpub/cku193.
45. Ross E, Oliver C. Preliminary analysis of the psychometric properties of the Mood, Interest and Pleasure questionnaire (MIPQ) for adults with severe and profound learning disabilities. Br J Clin Psychol. 2003; 42: 81-93.
46. Donnay DAC, Borgen FH. Validity, structure, and content of the 1994 - Strong Interest Inventory. J Couns. 1996; 43: 275–291.
47. Ipek Coban G, Bilgin S. Development of the scale of hygıene behavıors for nursıng students. BMC Med Res Methodol. 2015; 15: 69. doi: 10.1186/s12874-015-0064-4. PMID: 26294066; PMCID: PMC4546221.
48. Goodman WK, Price LH, Rasmussen SA, Mazure C, Fleischmann RL, Hill CL, et al. The Yale-Brown Obsessive Compulsive Scale: I. development, use, and reliability. Arch Gen Psychiatry 1989; 46: 1006–1011. 10.1001/archpsyc.1989.01810110048007
49. Sarang SD, Shitole RB, Karnam AG. To investigate the association between sleep and happiness among nurses with different personality traits: A cross-sectional study. Indian J Occup Ther 2019; 51: 3-7.
50. Tsaousis I, Kerpelis P. The traits personality questionnaire 5 (TPQue5). Eur J Psychol Assess. 2004; 20 (3): 0–191.
51. Kay SR, Fiszbein A, Opler LA. The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr Bull. 1987; 13 (2): 261-276.
52. Knufinke M, Nieuwenhuys A., Geurts SAE, Coenen AML, Kompier MAJ. Self-reported sleep quantity, quality and sleep hygiene in elite athletes. J Sleep Res. 2018; 27: 78-85. doi:10.1111/jsr.12509
53. Sheehan B. Assessment scales in dementia. Ther Adv Neurol Disord. 2012; 5 (6): 349-358. doi: 10.1177/1756285612455733. PMID: 23139705; PMCID: PMC3487532.
54. Rastogi S. Development and validation of a Prototype Prakriti Analysis Tool (PPAT): Inferences from a pilot study. Ayu. 2012; 33 (2): 209-218. doi: 10.4103/0974-8520.105240. PMID: 23559792; PMCID: PMC3611641.
55. Rotti H, Raval R, Anchan S, Bellampalli R, Bhale S, Bharadwaj R et al. Determinants of prakriti, the human constitution types of Indian traditional medicine and its correlation with contemporary science. J Ayurveda Integr Med. 2014; 5 (3): 167-175. doi: 10.4103/0975-9476.140478. PMID: 25336848; PMCID: PMC4204287.
56. Suchitra SP, Jagan A, Nagendra HR. Development and initial standardization of Ayurveda child personality inventory. J Ayurveda Integr Med. 2014; 5 (4): 205-208. doi: 10.4103/0975-9476.146562. PMID: 25624693; PMCID: PMC4296431.
57. Shilpa S, Murthy CG. Development and standardization of Mysore Tridosha scale. Ayu. 2011; 32 (3): 308-314. doi: 10.4103/0974-8520.93905. PMID: 22529642; PMCID: PMC3326873.
58. Ware JE Jr, Gandek B, Guyer R, Deng N. Standardizing disease-specific quality of life measures across multiple chronic conditions: development and initial evaluation of the QOL Disease Impact Scale (QDIS®). Health Qual Life Outcomes. 2016; 14: 84. doi: 10.1186/s12955-016-0483-x. PMID: 27255462; PMCID: PMC4890258.
59. Sylvia LG, Bernstein EE, Hubbard JL, Keating L, Anderson EJ. Practical guide to measuring physical activity. J Acad Nutr Diet. 2014; 114 (2): 199-208. doi: 10.1016/j.jand.2013.09.018. PMID: 24290836; PMCID: PMC3915355.
60. Hjollund NH, Andersen JH, Bech P. Assessment of fatigue in chronic disease: a bibliographic study of fatigue measurement scales. Health Qual Life Outcomes. 2007; 5: 12. doi: 10.1186/1477-7525-5-12. PMID: 17326844; PMCID: PMC1808447.
61. Qassem M, Kyriacou P. Review of Modern Techniques for the Assessment of Skin Hydration. Cosmetics. 2019; 6 (1):19. doi:10.3390/cosmetics6010019
62. Venkatesan S. Indian scales and inventories. Indian J Psychiatry. 2010; 52 (Suppl 1): S378-85. doi: 10.4103/0019-5545.69273. PMID: 21836709; PMCID: PMC3146211.
63. Committee on Psychological Testing, Including Validity Testing, for Social Security Administration Disability Determinations; Board on the Health of Select Populations; Institute of Medicine. Psychological Testing in the Service of Disability Determination. Washington (DC): National Academies Press (US); 2015. Available from: https://www.ncbi.nlm.nih.gov/books/NBK305230/
64. James BL, Loken E, Roe LS, Myrissa K, Lawton CL, Dye L, Rolls BJ. Validation of the Diet Satisfaction Questionnaire: a new measure of satisfaction with diets for weight management. Obes Sci Pract. 2018; 4 (6): 506-514. doi: 10.1002/osp4.299. PMID: 30574344; PMCID: PMC6298208.
65. Bivoltsis A, Trapp GSA, Knuiman M, Hooper P, Ambrosini GL. Can a Simple Dietary Index Derived from a Sub-Set of Questionnaire Items Assess Diet Quality in a Sample of Australian Adults? Nutrients. 2018; 10 (4): 486. doi: 10.3390/nu10040486. PMID: 29652828; PMCID: PMC5946271.
66. Godwin M, Streight S, Dyachuk E, van den Hooven EC, Ploemacher J, Seguin R, Cuthbertson S. Testing the Simple Lifestyle Indicator Questionnaire: Initial psychometric study. Can Fam Physician. 2008 Jan;54(1):76-7. PMID: 18208960; PMCID: PMC2293321.

67. Darviri C, Alexopoulos EC, Artemiadis AK, Tigani X, Kraniotou C, Darvyri P, Chrousos GP. The Healthy Lifestyle and Personal Control Questionnaire (HLPCQ): a novel tool for assessing self-empowerment through a constellation of daily activities. BMC Public Health. 2014 Sep 24;14:995. doi: 10.1186/1471-2458-14-995. PMID: 25253039; PMCID: PMC4192765.
68. Momayyezi M, Fallahzadeh H, Momayyezi M. Construction and Validation the Lifestyle Questionnaire Related to Cancer. Iran J Cancer Prev. 2015 Oct;8(5):e3965. doi: 10.17795/ijcp-3965. Epub 2015 Oct 27. PMID: 26634112; PMCID: PMC4667238.
69. Ping W, Cao W, Tan H, Guo C, Dou Z, Yang J. Health protective behavior scale: Development and psychometric evaluation. PLoS One. 2018; 13 (1): e0190390. doi: 10.1371/journal.pone.0190390. PMID: 29309423; PMCID: PMC5757924.
70. Eswaran HT, Kavita MB, Tripaty TB, Shivakumar. Formation and validation of questionnaire to assess Jāṭharāgni. Anc Sci Life. 2015; 34 (4): 203-209. doi: 10.4103/0257-7941.159829. PMID: 26283805; PMCID: PMC4535068.
71. Singh A, Singh G, Patwardhan K, Gehlot S. Development, Validation, and Verification of a Self-Assessment Tool to Estimate Agnibala (Digestive Strength). J Evid Based Complementary Altern Med. 2017; 22 (1): 134-140. doi: 10.1177/2156587216656117. Epub 2016 Jul 4. PMID: 27381899; PMCID: PMC5871217.
72. Haefeli M, Elfering A. Pain assessment. Eur Spine J. 2006; 15 (Suppl 1): S17-24. doi: 10.1007/s00586-005-1044-x. PMID: 16320034; PMCID: PMC3454549.
73. Borg S, Eeg-Olofsson K, Palaszewski B, Svedbo Engström M, Gerdtham UG, Gudbjörnsdottir S. Patient-reported outcome and experience measures for diabetes: development of scale models, differences between patient groups and relationships with cardiovascular and diabetes complication risk factors, in a combined registry and survey study in Sweden. BMJ Open. 2019; 9 (1): e025033. doi: 10.1136/bmjopen-2018-025033. PMID: 30612113; PMCID: PMC6326341.
74. Wu X, Li Z, Cao J, Jiao J, Wang Y, Liu G, Liu Y, Li F, Song B, Jin J, Liu Y, Wen X, Cheng S, Wan X. The association between major complications of immobility during hospitalization and quality of life among bedridden patients: A 3 month prospective multi-center study. PLoS One. 2018; 13 (10): e0205729. doi: 10.1371/journal.pone.0205729. PMID: 30312330; PMCID: PMC6185860.
75. Stieger S, Kuhlmann T. Validating Psychometric Questionnaires Using Experience-Sampling Data: The Case of Nightmare Distress. Front Neurosci. 2018; 12: 901. doi: 10.3389/fnins.2018.00901. PMID: 30568572; PMCID: PMC6290086.
76. Li P, Yang F, Wang X, Yao R, Dai J, Deng Y. What Do You Think About Your Dreams? The construction of a belief about dreams questionnaire. Nat Sci Sleep. 2019; 11: 411-421. doi: 10.2147/NSS.S227154. PMID: 31997884; PMCID: PMC6917598.
77. García-Domínguez JM, Martínez-Ginés ML, Carmona O, Caminero AB, Prefasi D, Maurino J, Ballesteros J; W-IMPACT Clinical Investigators. Measuring burden in caregivers of people with multiple sclerosis: psychometric properties of the CSI questionnaire. Patient Prefer Adherence. 2019; 13: 101-106. doi: 10.2147/PPA.S180863. PMID: 30666093; PMCID: PMC6330972.
78. Tan CE, Abdul Aziz AF, Hi MY, Azmi NSA, Ishak NK, Farid FAM, Zulkafli MN. Validation of the Caregiving Knowledge Questionnaire-My: Measuring Knowledge Regarding Positioning and Feeding among Malaysian Informal Caregivers of Stroke Patients. Indian J Palliat Care. 2018; 24 (4): 406-410. doi: 10.4103/IJPC.IJPC_99_18. PMID: 30410251; PMCID: PMC6199835.
79. Pandey RN, Halder SK, Rath PK. Development and Validation of "Caregiver Burden Scale-Indian Population". Int J Prev Med. 2019; 10: 31. doi: 10.4103/ijpvm.IJPVM_500_17. PMID: 30967917; PMCID: PMC6425768.
80. Piggott CA, Zimmerman S, Reed D, Sloane PD. Development and Testing of a Measure of Caregiver Confidence in Medical Sign/Symptom Management. Am J Alzheimers Dis Other Demen. 2017; 32 (7): 373-381. doi: 10.1177/1533317517711247. PMID: 28558474; PMCID: PMC5529254.
81. Study Lecture Notes (2020). Factors of personality, Biological, Social, Cultural & Situational. Available from: http://studylecturenotes.com/factors-of-personality-biological-social-cultural-situational/ [Accessed on: 20th April 2020].
82. Mamidi P, Gupta K. Obsessive compulsive disorder – 'Sangama graha': An Ayurvedic view. J Pharm Sci Innov. 2015; 4 (3): 156-164.
83. Agorastos A, Demiralay C, Huber CG. Influence of religious aspects and personal beliefs on psychological behavior: focus on anxiety disorders. Psychol Res Behav Manag. 2014; 7: 93-101. doi: 10.2147/PRBM.S43666. PMID: 24648780; PMCID: PMC3956626.
84. Li Y, Marques L, Hinton DE, Wang Y, Xiao ZP. Symptom dimensions in Chinese patients with obsessive-compulsive disorder. CNS Neurosci Ther. 2009; 15 (3): 276-282. doi: 10.1111/j.1755-5949.2009.00099.x. PMID: 19691547; PMCID: PMC6494015.
85. Reddy MS, Vijay MS, Reddy S. Obsessive-compulsive (Anankastic) Personality Disorder: A Poorly Researched Landscape with Significant Clinical Relevance. Indian J Psychol Med. 2016; 38 (1): 1-5. doi: 10.4103/0253-7176.175085. PMID: 27011394; PMCID: PMC4782437.
86. Jackson M, Marks L, May GHW, Wilson JB. The genetic basis of disease. Essays Biochem. 2018; 62(5):643-723. doi: 10.1042/EBC20170053. PMID: 30509934; PMCID: PMC6279436.
87. Singleton A, Hardy J. The Evolution of Genetics: Alzheimer's and Parkinson's Diseases. Neuron. 2016; 90 (6): 1154-1163. doi: 10.1016/j.neuron.2016.05.040. PMID: 27311081; PMCID: PMC4936485.
88. Sakthivel M, Krishnamoorthy Y, Sarveswaran G, Jayalakshmy R, Priyan S, Bharathnag N. Screening for red flag symptoms of cancer: A community-based cross-sectional study from urban Puducherry, India. J Educ Health Promot 2018; 7:174. doi: 10.4103/jehp.jehp_89_18. PMID: 30788377; PMCID: PMC6333027.
89. Cojocaru M, Cojocaru IM, Silosi I, Vrabie CD. Manifestations of systemic lupus erythematosus. Maedica (Buchar) 2011; 6 (4): 330-336. PMID: 22879850; PMCID: PMC3391953.
90. Do TP, Remmers A, Schytz HW, Schankin C, Nelson SE, Obermann M, Hansen JM, Sinclair AJ, Gantenbein AR, Schoonman GG. Red and orange flags for secondary headaches in clinical practice: SNNOOP10 list. Neurology 2019; 92 (3): 134-144. doi: 10.1212/WNL.0000000000006697. PMID: 30587518; PMCID: PMC6340385.
91. Irani S. Distant metastasis from oral cancer: A review and molecular biologic aspects. J Int Soc Prev Community Dent 2016; 6 (4): 265-271. doi: 10.4103/2231-0762.186805. PMID: 27583211; PMCID: PMC4981925.
92. Rector T, Taylor B, Sultan S, et al. Life Expectancy Calculators [Internet]. Washington (DC): Department of Veterans Affairs (US); 2016. Introduction. Available from: https://www.ncbi.nlm.nih.gov/books/NBK424557/
93. Yourman LC, Lee SJ, Schonberg MA, Widera EW, Smith AK. Prognostic indices for older adults: a systematic review. JAMA. 2012; 307 (2): 182-192. doi: 10.1001/jama.2011.1966. PMID: 22235089; PMCID: PMC3792853.
94. Goldman N, Glei DA, Weinstein M. What Matters Most for Predicting Survival? A Multinational Population-Based Cohort Study. PLoS One. 2016; 11 (7): e0159273. doi: 10.1371/journal.pone.0159273. PMID: 27434271; PMCID: PMC4951106.
95. Treesirichod A, Chansakulporn S, Wattanapan P. Correlation between skin color evaluation by skin color scale chart and narrowband reflectance spectrophotometer. Indian J Dermatol. 2014; 59 (4): 339-342. doi: 10.4103/0019-5154.135476. PMID: 25071249; PMCID: PMC4103266.

96. Everett JS, Budescu M, Sommers MS. Making sense of skin colour in clinical care. Clin Nurs Res. 2012; 21 (4): 495-516. doi: 10.1177/1054773812446510. PMID: 22645403; PMCID: PMC3465481.
97. Adeyinka A, Samanapally H, Kondamudi NP. Cyanosis. [Updated 2020 Mar 5]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK482247/
98. Das S, Maiti A. Acrocyanosis: an overview. Indian J Dermatol 2013; 58 (6): 417-420. doi: 10.4103/0019-5154.119946. PMID: 24249890; PMCID: PMC3827510.
99. Steinhorn RH. Evaluation and management of the cyanotic neonate. Clin Pediatr Emerg Med 2008; 9 (3): 169-175. doi: 10.1016/j.cpem.2008.06.006. PMID: 19727322; PMCID: PMC2598396.
100. Cestari TF, Dantas LP, Boza JC. Acquired hyperpigmentations. An Bras Dermatol. 2014; 89 (1): 11-25. doi: 10.1590/abd1806-4841.20142353. PMID: 24626644; PMCID: PMC3938350.
101. Hedera P. Update on the clinical management of Wilson's disease. Appl Clin Genet 2017; 10: 9-19. doi: 10.2147/TACG.S79121. PMID: 28144156; PMCID: PMC5245916.
102. Nandi M, Sarkar S, Mondal R. Generalized hyperpigmentation in Wilson's disease: An unusual association. J Neurosci Rural Pract 2013; 4 (1): 70-72. doi: 10.4103/0976-3147.105621. PMID: 23546359; PMCID: PMC3579056.
103. Rosen J, Yosipovitch G. Skin Manifestations of Diabetes Mellitus. [Updated 2018 Jan 4]. In: Feingold KR, Anawalt B, Boyce A, et al., editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000. Available from: https://www.ncbi.nlm.nih.gov/books/NBK481900/
104. Katoch S, Barua TN, Barua KN. The curious case of an elusive solitary plaque. Indian Dermatol Online J 2020; 11: 288-290. Available from: http://www.idoj.in/text.asp?2020/11/12/288/280256
105. Stillman AE. Jaundice. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition. Boston: Butterworths; 1990. Chapter 87. Available from: https://www.ncbi.nlm.nih.gov/books/NBK413/
106. Sadasivan J, Maroju NK, Balasubramaniam A. Necrotizing fasciitis. Indian J Plast Surg. 2013; 46 (3): 472-478. doi: 10.4103/0970-0358.121978. PMID: 24459334; PMCID: PMC3897089.
107. Uzoma M, Singh G, Kohen L. Green palmoplantar vesicular eruption in a patient with hyperbilirubinemia. JAAD Case Rep. 2017; 3 (4): 273-275. doi: 10.1016/j.jdcr.2017.05.001. PMID: 28653028; PMCID: PMC5473538.
108. van Geel N, Speeckaert M, Chevolet I, De Schepper S, Lapeere H, Boone B, Speeckaert R. Hypomelanoses in children. J Cutan Aesthet Surg. 2013; 6 (2): 65-72. doi: 10.4103/0974-2077.112665. PMID: 24023426; PMCID: PMC3764650.
109. Sheth TN, Choudhry NK, Bowes M, Detsky AS. The relation of conjunctival pallor to the presence of anemia. J Gen Intern Med. 1997; 12 (2): 102-106. doi: 10.1046/j.1525-1497.1997.00014.x. PMID: 9051559; PMCID: PMC1497067.
110. Rashpa RS, Mahajan VK, Kumar P, Mehta KS, Chauhan PS, Rawat R, Sharma V. Mucocutaneous manifestations in patients with chronic kidney disease: A cross sectional study. Indian Dermatol Online J 2018; 9: 20-26. Available from: http://www.idoj.in/text.asp?2018/9/1/20/223715
111. Tang J, Bergman J, Lam JM. Harlequin colour change: unilateral erythema in a newborn. CMAJ 2010; 182 (17): E801. doi: 10.1503/cmaj.092038. PMID: 20713575; PMCID: PMC2988569.
112. Singh J, Singh A. Differential cyanosis. Am J Med. 2013; 126 (10): e9. Available from: https://doi.org/10.1016/j.amjmed.2013.03.014
113. Izikson L, English III JC, Zirwas MJ. The flushing patient: differential diagnosis, workup, and treatment. J Am Acad Dermatol 2006; 55 (2): 193-208. doi: 10.1016/j.jaad.2005.07.057
114. Lee YJ, Park K. Secondary Raynaud's phenomenon and skin necrosis of toes in the paraplegic patient with hypertension. Drug Saf - Case Rep 2018; 5 (7). https://doi.org/10.1007/s40800-018-0071-6
115. Morrow R. verywellhealth (2020). An overview of pressure sores: Changes in skin colour and temperature offer clues a sore is forming. Available from: https://www.verywellhealth.com/knowing-a-pressure-ulcer-has-begun-1131993 [Accessed on: 22 April 2020].
116. Cestari TF, Dantas LP, Boza JC. Acquired hyperpigmentations. An Bras Dermatol. 2014; 89 (1): 11-25. doi: 10.1590/abd1806-4841.20142353. PMID: 24626644; PMCID: PMC3938350.
117. Song X, Shen Y, Zhou Y, Lou Q, Han L, Ho JK, Ren Y. General hyperpigmentation induced by Grave's disease: A case report. Medicine (Baltimore). 2018; 97 (49): e13279. doi: 10.1097/MD.0000000000013279. PMID: 30544387; PMCID: PMC6310574.
118. Nandi M, Sarkar S, Mondal R. Generalized hyperpigmentation in Wilson's disease: An unusual association. J Neurosci Rural Pract. 2013; 4 (1): 70-72. doi: 10.4103/0976-3147.105621. PMID: 23546359; PMCID: PMC3579056.
119. Sreeja C, Ramakrishnan K, Vijayalakshmi D, Devi M, Aesha I, Vijayabanu B. Oral pigmentation: A review. J Pharm Bioallied Sci. 2015; 7 (Suppl 2): S403-8. doi: 10.4103/0975-7406.163471. PMID: 26538887; PMCID: PMC4606629.
120. Yao WC, Emerick KS, Kraft S, Holbrook EH. Nasal mucosal melanosis may act as a harbinger of melanoma: A case report. Allergy Rhinol (Providence). 2016; 7 (3): 164-167. doi: 10.2500/ar.2016.7.0174. PMID: 28107150; PMCID: PMC5244274.
121. Shetty SR, Subhas BG, Rao KA, Castellino R. Nevus of ota with buccal mucosal pigmentation: a rare case. Dent Res J (Isfahan). 2011; 8 (1): 52-55. PMID: 22132016; PMCID: PMC3177382.
122. Breunig Jde A, Hartmann M, Freire CF, de Almeida HL Jr. Harlequin syndrome in childhood--case report. An Bras Dermatol. 2012; 87 (6): 907-909. doi: 10.1590/s0365-05962012000600015. PMID: 23197213; PMCID: PMC3699916.\
123. Deshingkar SA, Barpande SR, Bhavthankar JD, Humbe JG. Progressive hemifacial atrophy (Parry-Romberg Syndrome). Contemp Clin Dent. 2012; 3(Suppl 1): S78-81. doi: 10.4103/0976-237X.95111. PMID: 22629073; PMCID: PMC3354790.
124. Kanagalingam S, Miller NR. Horner syndrome: clinical perspectives. Eye Brain. 2015; 7: 35-46. doi: 10.2147/EB.S63633. PMID: 28539793; PMCID: PMC5398733.
125. Stern LZ, Bernick C. The Motor System and Gait. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition. Boston: Butterworths; 1990. Chapter 68. Available from: https://www.ncbi.nlm.nih.gov/books/NBK391/
126. Yew KS, Cheng E. Acute stroke diagnosis. Am Fam Physician. 2009; 80 (1): 33-40. PMID: 19621844; PMCID: PMC2722757.
127. Jerath NU, Grider T, Shy ME. Progressive Lower Extremity Weakness and Axonal Sensorimotor Polyneuropathy from a Mutation in KIF5A. Case Rep Genet. 2015; 2015: 496053. doi: 10.1155/2015/496053. PMID: 26543653; PMCID: PMC4620279.
128. Nayak R. Practical approach to the patient with acute neuromuscular weakness. World J Clin Cases. 2017; 5 (7): 270-279. doi: 10.12998/wjcc.v5.i7.270. PMID: 28798922; PMCID: PMC5535318.
129. Granados S, Ana M, Garcia P, Lina M, Ortega T, Cesar A, Lopez L. Diagnostic approach to myelopathies. Rev Colomb Radiolo. 2011; 22 (3): 3231-51. Available from: https://www.webcir.org/revistavirtual/articulos/diciembre11/colombia/col_ingles_a.pdf
130. Warner MJ, Hutchison J, Varacallo M. Bell Palsy. [Updated 2020 Mar 24]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK482290/
131. Pathi J, Mishra P, Kumar H, Panda A. Parry-Romberg syndrome affecting one half of the body. J Int Soc Prev

Community Dent. 2016; 6 (4): 387-390. doi: 10.4103/2231-0762.186792. PMID: 27583230; PMCID: PMC4981944.
132. Verrotti A, Prezioso G, Scattoni R, Chiarelli F. Autonomic neuropathy in diabetes mellitus. Front Endocrinol (Lausanne). 2014; 5: 205. doi: 10.3389/fendo.2014.00205. PMID: 25520703; PMCID: PMC4249492.
133. Ziemssen T, Siepmann T. The Investigation of the Cardiovascular and Sudomotor Autonomic Nervous System-A Review. Front Neurol. 2019; 10: 53. doi: 10.3389/fneur.2019.00053. PMID: 30809183; PMCID: PMC6380109.
134. Gorman PH. Unilateral hyperhidrosis from a contralateral source in an individual with C4 complete tetraplegia. J Spinal Cord Med. 2010; 33 (4): 428-430. doi: 10.1080/10790268.2010.11689723. PMID: 21061904; PMCID: PMC2964033.
135. Brackenrich J, Fagg C. Hyperhidrosis. [Updated 2019 Nov 22]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK459227/
136. Kocyigit P, Akay BN, Saral S, Akbostanci C, Bostanci S. Unilateral hyperhidrosis with accompanying contralateral anhidrosis. Clin Exp Dermatol 2009; 34 (8): e544-6. doi: 10.1111/j.1365-2230.2008.03070.x.
137. Yadalla HK, Ambika H, Chawla S. A case of idiopathic unilateral circumscribed hyperhidrosis. Indian J Dermatol. 2013; 58 (2): 163. doi: 10.4103/0019-5154.108102. PMID: 23716850; PMCID: PMC3657260.
138. Sudy E, Urbina F. Unilateral acne after facial palsy. An Bras Dermatol. 2018; 93 (3): 441-442. doi: 10.1590/abd1806-4841.20187437. PMID: 29924238; PMCID: PMC6001108.
139. Thomas SE, Conway J, Ebling FJ, Harrington CI. Measurement of sebum excretion rate and skin temperature above and below the neurological lesion in paraplegic patients. Br J Dermatol. 1985; 112: 569–573. doi: 10.1111/j.1365-2133.1985.tb15265.x
140. Badri T, Hariz A. Scleroderma (Systemic Sclerosis) [Updated 2020 Jan 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537335/
141. Azizi T, Zarinpour N, Hasrak K. Common Skin Lesions of the Face. A Textbook of Advanced Oral and Maxillofacial Surgery (2016); Volume 3, Hosein M, Motamedi K. IntechOpen, DOI: 10.5772/63426. Available from: https://www.intechopen.com/books/a-textbook-of-advanced-oral-and-maxillofacial-surgery-volume-3/common-skin-lesions-of-the-face
142. Vora RV, Kota RS, Diwan NG, Jivani NB, Gandhi SS. Skin: A mirror of internal malignancy. Indian J Med Paediatr Oncol. 2016; 37 (4): 214-222. doi: 10.4103/0971-5851.195730. PMID: 28144085; PMCID: PMC5234155.
143. Williams ML, Sagebiel RW: Melanoma risk factors and atypical moles. West j Med 1994; 160: 343-350. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1022426/pdf/westjmed00068-0049.pdf
144. Singal A, Arora R. Nail as a window of systemic diseases. Indian Dermatol Online J. 2015; 6 (2): 67-74. doi: 10.4103/2229-5178.153002. PMID: 25821724; PMCID: PMC4375768.
145. Payne-James JJ, Munro MH, Payne CR. Pseudosclerodermatous triad of perniosis, pulp atrophy and 'parrot-beaked'clawing of the nails–a newly recognized syndrome of chronic crack-cocaine use. J. Forensic. Leg. Med. 2007; 14 (2): 65-71. doi:10.1016/j.jcfm.2006.01.013
146. Khurana AK (2007). Diseases of the lens, Comprehensive Ophthalmology (4th ed). New Delhi: New Age International (P) Ltd.
147. Roxe DM. Urinalysis. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition. Boston: Butterworths; 1990. Chapter 191. Available from: https://www.ncbi.nlm.nih.gov/books/NBK302/
148. Kasırga E. The importance of stool tests in diagnosis and follow-up of gastrointestinal disorders in children. Turk Pediatri Ars. 2019; 54 (3): 141-148. doi: 10.14744/TurkPediatriArs.2018.00483. PMID: 31619925; PMCID: PMC6776453.
149. Temprano KK. A Review of Raynaud's Disease. Mo Med. 2016; 113 (2): 123-126. PMID: 27311222; PMCID: PMC6139949.
150. McMullen SM, Patrick W. Cyanosis. Am J Med 2013; 126 (3): P210-212. doi: https://doi.org/10.1016/j.amjmed.2012.11.004
151. Hui D, Dos Santos R, Chisholm G, Bansal S, Souza Crovador C, Bruera E. Bedside clinical signs associated with impending death in patients with advanced cancer: preliminary findings of a prospective, longitudinal cohort study. Cancer. 2015; 121 (6): 960-967. doi: 10.1002/cncr.29048. PMID: 25676895; PMCID: PMC4352117.
152. Hirakawa Y, Uemura K. Signs and Symptoms of Impending Death in End-of-life Elderly Dementia Sufferers: Point of View of Formal Caregivers in Rural Areas: A Qualitative Study-. J Rural Med. 2012; 7 (2): 59-64. doi: 10.2185/jrm.7.59. PMID: 25649740; PMCID: PMC4309317.
153. Smith MC, Yamashita TE, Bryant LL, Hemphill L, Kutner JS. Providing massage therapy for people with advanced cancer: what to expect. J Altern Complement Med. 2009; 15 (4): 367-371. doi: 10.1089/acm.2008.0391. PMID: 19388858; PMCID: PMC3189000.
154. Piumelli R, Davanzo R, Nassi N, Salvatore S, Arzilli C, Peruzzi M, Agosti M, Palmieri A, Paglietti MG, Nosetti L, Pomo R, De Luca F, Rimini A, De Masi S, Costabel S, Cavarretta V, Cremante A, Cardinale F, Cutrera R. Apparent Life-Threatening Events (ALTE): Italian guidelines. Ital J Pediatr. 2017; 43 (1): 111. doi: 10.1186/s13052-017-0429-x. PMID: 29233182; PMCID: PMC5728046.
155. Mehta DD, Hillman RE. Voice assessment: updates on perceptual, acoustic, aerodynamic, and endoscopic imaging methods. Curr Opin Otolaryngol Head Neck Surg. 2008; 16 (3): 211-215. doi: 10.1097/MOO.0b013e3282fe96ce. PMID: 18475073; PMCID: PMC3775647.
156. Siau RTK, Goswamy J, Jones S, Khwaja S. Is OperaVOX a clinically useful tool for the assessment of voice in a general ENT clinic? BMC Ear Nose Throat Disord. 2017; 17: 4. doi: 10.1186/s12901-017-0037-9. PMID: 28439206; PMCID: PMC5399865.
157. Dejonckere PH, Obbens C, de Moor GM, Wieneke GH. Perceptual evaluation of dysphonia: reliability and relevance. Folia Phoniatr (Basel) 1993; 45 (2): 76–83. doi: 10.1159/000266220.
158. Gerratt BR, Kreiman J, Garellek M. Comparing Measures of Voice Quality from Sustained Phonation and Continuous Speech. J Speech Lang Hear Res. 2016; 59 (5): 994-1001. doi: 10.1044/2016_JSLHR-S-15-0307. PMID: 27626612; PMCID: PMC5345563.
159. Francis DO, Daniero JJ, Hovis KL, Sathe N, Jacobson B, Penson DF, Feurer ID, McPheeters ML. Voice-Related Patient-Reported Outcome Measures: A Systematic Review of Instrument Development and Validation. J Speech Lang Hear Res. 2017; 60 (1): 62-88. doi: 10.1044/2016_JSLHR-S-16-0022. PMID: 28030869; PMCID: PMC5533561.
160. Sun C, Yang Y, Wen C, Xie K, Wen F. Voiceprint Identification for Limited Dataset Using the Deep Migration Hybrid Model Based on Transfer Learning. Sensors (Basel). 2018; 18 (7): 2399. doi: 10.3390/s18072399. PMID: 30041500; PMCID: PMC6068892.
161. Kiakojoury K, Dehghan M, Hajizade F, Khafri S. Etiologies of Dysphonia in Patients Referred to ENT Clinics Based on Videolaryngoscopy. Iran J Otorhinolaryngol. 2014; 26 (76): 169-174. PMID: 25009807; PMCID: PMC4087856.
162. Omori K. Diagnosis of voice disorders. JMAJ 2011; 54 (4): 248-253. Available from: https://www.med.or.jp/english/journal/pdf/2011_04/248_253.pdf
163. Lee L, Stemple JC, Glaze L, Kelchner LN. Quick Screen for Voice and Supplementary Documents for Identifying Pediatric Voice Disorders. Lang Speech Hear Ser 2004; 35 (4): 308-319.

164. Ropper AH, Adams RD, Victor M, Brown RH & Victor M (2005). Adams and Victor's principles of neurology (6th ed). New York: McGraw-Hill Medical Pub. Division.
165. Nadarajan V, Perry RJ, Johnson J, Werring DJ. Transient ischaemic attacks: mimics and chameleons. Pract Neurol. 2014; 14 (1): 23-31. doi: 10.1136/practneurol-2013-000782. PMID: 24453269; PMCID: PMC3913122.
166. Singh N, Ray S, Srivastava A. A clinical mimicker of amyotrophic lateral sclerosis - conditions we cannot afford to miss. Ann Indian Acad Neurol 2018; 21: 173-178. Available from: http://www.annalsofian.org/text.asp?2018/21/3/173/240434
167. Navi BB, Iadecola C. Ischemic stroke in cancer patients: A review of an underappreciated pathology. Ann Neurol. 2018; 83 (5): 873-883. doi: 10.1002/ana.25227. PMID: 29633334; PMCID: PMC6021225.
168. Williamson AJ, Shermetaro C. Unilateral Vocal Cord Paralysis. [Updated 2019 Dec 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK535420/
169. Gavrila GA, Mihaila RG, Manitiu I. Differential diagnosis problems in a patient with dysphonia and chronic lymphocytic leukemia. Pak J Med Sci. 2015; 31 (1): 223-225. doi: 10.12669/pjms.311.6091. PMID: 25878649; PMCID: PMC4386192.
170. Reiter R, Hoffmann TK, Pickhard A, Brosch S. Hoarseness-causes and treatments. Dtsch Arztebl Int. 2015; 112 (19): 329-337. doi: 10.3238/arztebl.2015.0329. PMID: 26043420; PMCID: PMC4458789.

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PUSHPITAKAM OF *CHARAKA INDRIYA STHANA* - AN EXPLORATIVE STUDY

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REVIEW ARTICLE

PUSHPITAKAM OF *CHARAKA INDRIYA STHANA* - AN EXPLORATIVE STUDY

Abstract:
Pushpitakam indriyam is the name of the second chapter of *Charaka samhita* (an ancient Indian textbook of medicine), *Indriya sthana* (one among the eight secions of *Charaka samhita*, which deals with prognostic aspects). *Indriya sthana* of *Charaka samhita* consists of various fatal signs and symptoms which denote imminent death and prognostication of life expectancy in dying patients. *Pushpitakam indriyam* deals with various fatal signs and symptoms pertaining to body odour and taste which denotes imminent death. The present study is aimed to explore the contents of '*Pushpitakam indriyam*' chapter and to analyse their role and potential in contemporary clinical prognostication. *Arishta lakshanas* (fatal signs & symptoms indicates imminent death) are vaiable quantitatively, qualitatively, in their mode of onest, course and manifestation etc. Classification of *Arishta lakshanas*, biases or CDRs (cognitive dispositions to respond) in decision making process while analysing *arishta lakshanas* and importance of debiasing strategies are mentioned in this chapter. Various physiological and pathological body odours and their prognostic significance is the main content of this chapter. Various prospective, longitudinal cohort studies are required to substantiate the association between *arishta lakshana's* and impending death. The association between *arishta lakshana's* and impending death should be studied on various parameters like 'Odds ratio', 'Sensitivity', 'Specificity', 'Positive and Negative likelihood ratio' etc. Various technological advances like 'E-nose', '*Byoshu'*, 'Gas chromatography', 'Gas chromatography with mass spectrometry' etc can be used to standardize the *Arishta lakshanas* pertaining to body odour. Further research works are required to substantiate the claims made in this chapter.

Key Words: *Arishta lakshana*, Bias, Body odour, *Charaka Samhita*, *Indriya sthana*, Prognosis

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INTRODUCTION:

Charaka Samhita is the oldest and believed to be the most authentic treatise on *Ayurveda* (traditional Indian system of Medicine). The presently available *Charaka Samhita* mentions Acharya *Punarvasu Atreya*, *Charaka*, and *Dridhabala*. *Acharya Punarvasu Atreya* is believed to have preached Ayurveda to his student *Agnivesha*, who composed the text which was later redacted by *Charaka* and completed by *Dridhabala*. [1] *Indriya sthana* of *Charaka samhita* consist of the description of various *Arishta lakshanas* which indicates imminent death. *Arishta lakshanas* are the signs and symptoms which denotes the definite death of the patient. Particular symptoms and signs of imminent death indicate the diminution of the span of life. [2]

Pushpitakam indriyam is the name of the second chapter of *Charaka samhita*, *Indriya sthana*. *Pushpitakam indriyam* deals with various fatal signs and symptoms pertaining to body odour and taste which denotes imminent death. The present chapter named *'Pushpitakam indriyam'* because the word '*Pushpa'* (flower) represents smell or odour, and this chapter deals with *arishta lakshana's* related to body odour. Though the chapter named as '*Pushpitakam'*, it also deals with *arishta lakshana's* related to '*Rasa'* (taste). [3] The present study is aimed to explore the various contents of '*Pushpitakam indriyam*' chapter and to analyse their role and potential in contemporary clinical prognostication.

MAIN CONTENTS:

पुष्पं यथा पूर्वरूपं फलस्येह भविष्यतः। तथा लिङ्गमरिष्टाख्यं पूर्वरूपं मरिष्यतः॥

Pushpam yathaa --- marishyataha [*Verse* 3] [3]]

As flower always precedes the fruit, *arishta lakshana's* also precedes the death.

अप्येवं तु भवेत् पुष्पं फलेनाननुबन्धि यत्। फलं चापि भवेत् किञ्चिद्यस्य पुष्पं न पूर्वजम्॥

न त्वरिष्टस्य जातस्य नाशोऽस्ति मरणादृते। मरणं चापि तन्नास्ति यन्नारिष्टपुरःसरम्॥

Apyevam tu bhavet --- purahssaram [*Verse* 4-5] [3]

There are some plants which don't produce fruits though they have flowers and some plants which give fruits without producing flowers. The example of association of flower and fruit is not suitable to denote the association between *arishta lakshana's* and impending death as presence of *arishta lakshana's* definitely indicates death. Odds ratio (OR) is useful to measure the strength of an association between two events [in present case they are *arishta lakshana's* (A) and death (D)]. OR is defined as the ratio of the odds of A (*arishta lakshana's*) in the presence of D (death) and the odds of A in the absence of D, or equivalently, the ration of the odds of D in the presence of A and the

odds of D in the absence of A. Odds ratio which is greater than 1, denotes A and D are associated or correlated whereas OR less than 1, indicates A and D are negatively correlated, and the presence of one event reduces the odds of the other event. A positive OR does not establish that D causes A, or that A causes D, it denotes only the strength of association (correlation doesn't imply causation). [4] According to the above verse the OR between *arishta lakshana's* and death is greater than 1 (i.e., there is a strong association between *arishta lakshana's* and death).

जातस्येति संपूर्णस्य, किञ्चिदुदिते ह्यरिष्टेऽसंपूर्णे नावश्यं मृत्युः।
अन्ये तु जातस्य नियतस्येति वर्णयन्ति।

Jaatasyeti --- varnayanti [*Chakrapani*, *Verse* 4-5] [3]

The word '*Jaatasya'* mentioned in the above verse denotes 'completeness' or 'with full intensity' of *arishta lakshana's*, which only indicates impending death. According to this hypothesis, there may be some *arishta lakshana's* which are 'incomplete' or 'not fully formed or developed' or having 'low intensity' in nature do exist which may not indicate impending death (i.e., *arishta lakshana's* are quantitatively variable and they can be measured based on their intensity).

द्विविधं हि रिष्टं नियतं चानियतं च। तत्र नियतं, 'मृतमेव तमात्रेयो व्याचक्षो पुनर्वसुः' इत्यादि, अनियतं यथा "संशयप्राप्तमात्रेयो मन्यते तस्य जीवितम्", "अरोगः संशयं गत्वा कश्चिदेव प्रमुच्यते" इति॥

Dvividham --- pramuchyate iti [*Chakrapani*, *Verse* 4-5] [3]

Arishta lakshana's are classified in to two groups '*Niyata'* (which definitely indicates impending death) and '*Aniyata'* (which may or may not indicate impending death). Some references or examples are also provided for both categories (i.e., *niyata* and *aniyata*) in above verse. '*Niyata arishta lakshana's*' are highly accurate in assessing prognosis whereas '*Aniyata arishta lakshna's*' are not highly accurate and this classification also indicates that *arishta lakshana's* are variable qualitatively and quantitatively.

क्षणेन हि रिष्टानि प्रादुर्भवन्ति।

Kshanena hi --- bhavanti [*Chakrapani*, *Verse* 4-5] [3]

Arishta lakshana's appears suddenly or they have striking manifestation. It indicates that the physician should be alert to find out them whenever they appear. The above verse also indicates that the course of *arishta lakshana's* after their manifestation or onset may vary (*arishta lakshana's* may disappear or they may show episodic nature or may become stable overtime or they may aggravate or decline in intensity). The physician should be aware of all these variations of *arishta lakshana's*.

***Pragnaaparaadha* and its management:**

मिथ्यादृष्टमरिष्टाभमनरिष्टमजानता। अरिष्टं वाऽप्यसंबुध्दमेतत् प्रज्ञापराधजम्॥

Mithyaadrushta --- pragnaaparaadhajam [*Verse* 6] [3]

Physicians often mistakenly diagnose *arishta lakshana's* when they are actually absent (false positive) and unable to identify *arishta lakshana's* though they are present (false negative). The words like '*Mithya drishti', 'Ajaanataa', 'Asambuddha'* and *'Pragnaaparaadha'* denotes various 'cognitive biases' or 'cognitive errors' or 'CDRs (cognitive dispositions to respond)' in decision making process while analysing *arishta lakshana's*. A critical subset of diagnostic errors arises through cognitive errors, especially those associated with failures in perception, failed heuristics, and biases; collectively, these have been referred to as cognitive dispositions to respond (CDRs). Various CDRs have been identified which leads to diagnostic errors such as, ascertainment bias, confirmation bias, gambler's fallacy, multiple alternatives bias, gender bias, omission bias, outcome bias, overconfidence bias and visceral bias etc. [5]

In Emergency medicine departments diagnostic uncertainty is most evident and delayed or missed diagnoses are mostly occurs here. Not surprisingly, all CDRs are evident in emergency medicine (also called as 'natural laboratory of error'). In emergency departments, poor access to information with limited time to process it leads to an error-producing conditions. One very clear goal in reducing diagnostic errors in medicine is to describe, analyze, and research CDRs in the context of medical decision making, and later to find effective 'cognitive debiasing strategies' to manage those CDRs. Removing the stigma of bias clears the way toward accepting the capricious nature of decision making. [5] Cognitive biases (i.e., anchoring and framing effects, information biases) and personality traits (e.g. tolerance to uncertainty, aversion to ambiguity) are the commonest factors which potentially affect physicians' decisions. Overconfidence, the anchoring effect, information and availability bias, and tolerance to risk may be associated with diagnostic inaccuracies or suboptimal management. [6]

ज्ञानसंबोधनार्थे तु लिङ्गैर्मरणपूर्वजैः। पुष्पितानुपदेक्ष्यामो नरान् बहुविधैर्बहून्॥

Gnaana sambodhanaardhe --- bahun [*Verse* 7] [3]

The word '*Gnaana sambodhana*' denotes various 'cognitive debiasing strategies' to correct '*Pragnaaparaadha'* or CDRs mentioned in the previous verse. There are number of 'cognitive debiasing strategies' for reducing CDRs. Various cognitive debiasing strategies like, developing insight or awareness, considering alternatives, metacognition, decreasing reliance on memory, getting specific training, simulation, cognitive forcing strategies, making tasks easier, minimizing time pressures, accountability and feedback etc have been useful to correct different CDRs. [5]

Acharya Charaka was aware of different diagnostic errors (*pragnaaparaadha*) physician makes in an emergency conditions and he has proposed strategies to correct those errors (*gnaana sambodhanaartham*). Physician should not feel ashamed by making errors (because they are common and unavoidable) related to *arishta lakshana's* but he should be alert to find out, analyze, correct and prevent those errors by following various strategies explained in *Indriya sthana*. 'बहुविधैर्बहून्' or 'बहुविधान् बहून्' denotes that *arishta lakshana's* are innumerable and they are variable qualitatively and quantitatively in nature.

***Arishta lakshna's* related to *gandha* (odour):**

नानापुष्पोपमो गन्धो यस्य भाति दिवानिशम्। पुष्पितस्य वनस्येव नानाद्रुम लतावतः॥

तमाहुः पुष्पितं धीरा नरं मरणलक्षणैः। स ना संवत्सराद्देहं जहातीति विनिश्चयः॥

Naanaa pushpopamo --- vinishchayaha [*Verse* 8-9] [3]

The person who emits different types of odours (which are abnormal and acquired) just like a garden having different types of flowers and emits different odours always is called '*Pushpita'*. The abnormal body odours appear or manifests all of a sudden without any visible reason are only considered as *arishta lakshana's.* The '*Pushpita'* person will die within a month. The word 'दिवानिशम्' indicates the stable nature of *arishta lakshana's* related to odour. In this context, body odour specific *arishta lakshana's* associated with death within a month are explained.

इष्टैर्वा यदि वाऽनिष्टैः स च पुष्पित उच्यते।

Ishtairvaa --- uchyate [*Verse* 10] [3]

Arishta lakshana's are classified in to two categories, '*ishta'* (pleasant / preferred) and '*anishta'* (disliked / unpleasant) based on liking or preference.

समासेनाशुभान् गन्धानेकत्वेनाथवा पुनः।

Samaasena --- punaha [*Verse* 11] [3]

Arishta lakshana's are again classified in to two categories, '*shubha'* (auspicious / good / pleasant) and '*ashubha'* (inauspicious / bad / unpleasant).

व्यत्यासेनानिमित्ताः स्युः स च पुष्पित उच्यते।

Vyatyaasena --- uchyate [*Verse* 12] [3]

The word 'व्यत्यासेन' denotes the 'abnormal or reverse nature' of *arishta lakshana's* (person emits unpleasant body odour even after application of a perfume) whereas 'अनिमित्त' denotes sudden manifestation of body odours without having any visible or known reason.

तद्यथा चन्दनं कुष्ठं तगरागुरुणी मधु। माल्यं मूत्रपुरीषे च मृतानि कुणपानि च॥

ये चान्ये विविधात्मनो गन्धा विविधयोनयः।

Tadyathaa --- yonayaha [*Verse* 13-14] [3]

वियोनिर्विदुरो गन्धो यस्य गात्रेषु जायते।

Viyoni --- jaayate [*Verse* 16] [3]

Different odours like *Chandana* (Santalum album), *Kushta* (Saussurea lappa), *Tagara* (Valeriana wallichii), *Agaru* (Aquilaria agallocha Roxb), *Madhu* (honey) and *Maalya* (garlands) etc are considered as '*Shubha'* or '*Ishta'* and odours like *Mutra* (urine), *Purisha* (faeces), *Mruta* (carcass), and *Kunapa* (corpse) etc are considered as '*Ashubha'* or '*Anishta'*.

मृतानीति मानुषव्यतिरिक्तानि गवादीनि मृतानि, कुणपानि तु मानुष शरीराणि। विविधयोनाय इत्यनेन नानाद्रव्यकृतधूपवर्त्यादिगन्धान् ग्राहयति; विविधात्मन इत्यनेन तु अकृत्रिमनानाद्रव्यगन्धा उच्यन्ते। वियानिरिति निर्हेतुकः। विदूर इति स्थायी॥

Mrutaaneeti --- sthaayee [*Chakrapani*, *Verse* 8-16] [3]

The word 'मृत' denotes animal's dead body (carcass) whereas the word 'कुणप' denotes a dead human body (corpse). The word 'विविधयोनय' denotes the odours emitted by artificially prepared substances whereas the word 'विविधात्मन' denotes odours coming out from natural substances. The word 'वियोनि' denotes the lack of known reason or cause for the manifestation of *arishta lakshana's* whereas the word 'विदूर' denotes 'stability' or stable nature of *arishta lakshana's* (i.e., *arishta lakshana's* mentioned in this context are stable and they won't disappear or change their course after their manifestation).

Odour finger prints / Odour signatures:

Human beings produce temporarily stable, genetically mediated odour signatures and they have the ability to recognise, discriminate and identify others through the sense of smell. The characteristic odour of every person, called the "body odour signature", is an essential source of information about the odour producer. Men and women differ in their body odour. According to several twin studies, the origin of odour individuality could be at least partly explained by genetic factors. Influence of genetic factors on the odour signature predicts its relative stability throughout life. [7] Human body odour is a highly complex biological system. An individual odour profile is relatively stable across the life span and contributes to individual olfactory identity. Individual body odour can also be altered by various intrinsic and extrinsic factors. [8]

Hundreds of volatile organic compounds (VOCs) are emitted from the human body and they vary with age, diet, sex, physiological status and genetic background. Disease specific VOCs can be used as diagnostic olfactory biomarkers of infectious diseases, metabolic diseases, genetic disorders and other kinds of diseases. Body odours can be considered as individual 'odour finger prints.' Pathological processes, such as infection and endogenous metabolic disorders, can influence our daily odour finger prints by producing new VOCs or by changing the ratio of VOCs that are produced normally. Therefore, it is not surprising that physicians have used their olfactory senses to diagnose physical

conditions of patients. Gas chromatography (GC) and gas chromatography and mass spectrometry (GC-MS) have been used to separate and identify VOCs. GC-MS-olfactometer (GC-MS-O) enables to examine mass spectra and odour qualities of individual GC-separated odorants simultaneously. VOCs are specific to certain diseases. [9] The odour emitted by the patient may be one of the first major clues leading to an early diagnosis. Numerous states of disease are associated with a characteristic odour [10] (Table 1 & 2). Thousands of years before *Charaka Samhita* has laid the foundation of concept of diagnosing illness and assessing prognosis based on the body odour. This statement is as true today as it was then.

विस्रत्वात् प्रभूत पूतिकक्षास्यशिरःशरीरगन्धाः।

Visratvaat --- gandhaaha [*Verse* 97] [11]

प्रभूतःपूतिः कक्षाप्रभृतिषु गन्धो येषां ते तथा।

Prabhutaha --- te tathaa [*Chakrapani*, *Verse* 97] [11]

According to the above verse, foul smell is emitted by *Pitta prakruti* (a specific type of constitution) individuals, which supports the theory of genetic background behind specific odours or odour finger prints or body odour signature or human body odour individuality.

***Byoshu*:**

Diseases are characterized by specific odours, particularly cancer, a characteristic known as *byoshu* in Japan. Recently, with developments in techniques for the analysis of odour it has become possible to analyze the odour elements that cause *byoshu. Byoshu* in cancer brought in limelight by a dog's discovery of a case of malignant melanoma, and several reports of trained dogs detecting cancer by smell have appeared since. The modified metabolites in cancer patients and / or necrotic organization cause *byoshu*. Ulceration of breast cancer through the skin is accompanied by a strengthening of body odour. The belief that a change in body odour is simply due to aging might result in missing the possibility that the change may also be due to a hidden sickness. [12]

E-nose:

Recently, there have been increasing interests in the application of E-nose (electronic nose) for measurement of human body odours. The VOCs released from the human body can provide information about diseases, behaviour, emotional state and health status of a person. In addition, body odour is one of the physical characteristics of a human that can be used to identify people. E-nose has been designed and equipped with software which can detect and classify human armpit body odour. An array of metal oxide sensors are used in E-nose for detecting volatile organic compounds. The E-nose is able to recognize people, even after application of deodorant. [13]

***Arishta lakshna's* related to *rasa* (blood chemistry?):**

यो रसः प्रकृतिस्थानां नराणां देहसंभवः। स एषां चरमे काले विकारं भजते द्वयम् ॥
कश्चिदेवास्यवैरस्यमत्यर्थमुपपद्यते। स्वादुत्वमपरश्चापि विपुलं भजते रसः॥
तमनेनानुमानेन विद्याद्विकृतिमागतम्। मनुष्यो हि मनुष्यस्य कथं रसमवाप्नुयात्॥
मक्षिकाश्चैव यूकाश्च दंशाश्च मशकैः सह। विरसादपसर्पन्ति जन्तो कायान्मुमूर्षतः॥
अत्यर्थरसिकं कायं कालपक्वस्य मक्षिकाः। अपि स्नातानुलिप्तस्य भृशमायान्ति सर्वशः॥

Yo rasaha prakruti --- sarvashaha [*Verse* 17-22] [3]

वैरस्यमिति अनिष्टरसताम्। अत्यर्थरसिकमिति अतिस्वादुरसम्॥

Vairasyamiti --- swaadu rasam [*Chakrapani*, *Verse* 17-22] [3]

According to the above verse, blood composition (*rasa*?) is individualistic and any pathological changes in that composition can be assessed or diagnosed by the behaviour of various insects like flies, mosquitoes, stinging insects or body louses. The word, 'वैरस्यम्' denotes abnormal blood components or composition which acts as repellent to various insects whereas the word, 'अत्यर्थरसिकम्' denotes blood composition or compounds (excessive blood sugar?) which increases the attractiveness to various biting insects. These are *arishta lakshana's* related to *rasa* which can't be perceived by the physician directly but by observing the attractiveness or repulsiveness to biting insect's physician can indirectly assess the condition or change of rasa in a particular person.

When selecting a human host, mosquitoes have a preference for certain individuals. Various factors contribute to differential attractiveness to biting insects. Pregnancy, greater body mass (greater surface area and CO_2 output), those infected with malaria, higher body temperatures with increased relative humidity and some dietary factors makes an individual more attractive to Anopheles gambiae (the principal malaria vector in Africa) and other mosquitoes. Consumption of garlic, vitamin B or beer will repel mosquitoes. It is likely that the production of human volatiles that attract or repel mosquitoes shows genetic variation. [14] Host location by female mosquitoes is mediated by host-derived physical (heat, moisture and visual cues) and chemical cues (VOCs). Volatiles released from human skin provide essential cues that guide this mosquito species to its host. Compounds that inhibit microbial production of human odour or manipulation of the composition of the skin microbiota may reduce a person's attractiveness to mosquitoes. [15] Human skin odors, produced mainly by bacteria from skin microbiota, are known to attract or repulse these insects. As more than 400 VOCs have already been identified from human skin emanations. [16]

It has been found that insects and licks aggregate around sources of ammonia. [17] A mixture of different odours and compounds like CO_2, shot chain carboxylic acids, ammonia and other sweat compounds

contributes to attraction of the insects. All species of insects are not equally attracted to humans and they show specific anthrophilic or zoophilic behaviour. A push-pull model comes in to play involving attractive and repelling components, the relative abundance of the hosts and the defensiveness of different species of hosts. [18] Chemical signals could provide particularly effective indicators of an individual's health and infection status. To diagnose diseases, physicians and veterinarians have long used the taste and smell of their patient's body odour, breath, urine and flatulence. Chemical signals provide information about an individual's genetic compatibility, infection status, alterations in immune and endocrine systems. The composition of volatile acids appears to be altered during the course of infection. Infected individuals have high concentrations of plasma corticosterone and low concentrations of androgens. [19]

Role of animals in detecting *Arishta lakshanas*:

According to a study, urine from mice with artificially induced cancerous lung tumours could be clearly discriminated from control urine by a trained mouse. Trained dogs can discriminate between blood samples from ovarian cancer patients and blood samples taken from patients with other gynaecological cancers or from healthy controls. Dogs can be used as cancer detectors because they have an extraordinary sense of smell (with odour detection thresholds as low as parts per trillion). In cases of melanoma, bladder cancer, ovarian cancer and colorectal cancer, dogs can be trained to distinguish patients based on VOCs from patients' urine, tumours or breath samples, more successfully. [9] *Charaka samhita* has laid foundations to the concept of using insects and animals to detect various *arishta lakshana's* or diagnosing diseases thousands of years before.

CONCLUSION:

Arishta lakshanas are variable qualitatively and quantitatively. Onset and course of *arishta lakshanas* is also variable. They may appear spontaneously and disappear in the next moment. The course may be stable or gradually progressive or episodic or gradually declining in nature. Physician should be alert to detect the *arishta lakshanas* properly by avoiding or minimizing CDRs. *Arishta lakshanas* are innumerable and are classified in to '*Shubha & Ashubha*' and '*Niyata & Aniyata*'. The association between *arishta lakshana's* and impending death should be studied on various parameters like 'Odds ratio', 'Sensitivity', 'Specificity', 'Positive and Negative likelihood ratio' etc. By using various technological advances, *arishta lakshana's* should be studied by using 'E-nose', '*Byoshu'*, 'Gas chromatography', 'Gas chromatography with mass spectrometry' etc. The association between specific '*Prakruti'* with specific VOCs should be standardized. Various concepts mentioned in the present chapter seem to have the potential clinical prognostic importance in contemporary medical practice.

Table 1: *Shubha* / *Ishta gandha's* (pleasant body odours) in various diseases

Odour	Disease
Acetone / Rotten apple	Diabetes / Diabetic ketoacidosis
Sweetish (मधु गन्ध)	Rice water stools of Cholera
Sweetish / Putrid (मधु गन्ध)	Diphtheria
Sweetish / Pungent (मधु गन्ध)	Small pox lesions
Baked-bread (मधु गन्ध)	Typhoid
Caramelized sugar (मधु गन्ध)	Maple syrup urine disease
Sweet (मधु गन्ध)	Leukaemia

Table 2: *Ashubha* / *Anishta gandha's* (unpleasant body odours) in various diseases

Odour	Disease
Offensive (अनिष्ट गन्ध)	Cancerous wounds / Infectious diseases / Gynaecological tumours / Necrotic cavity on penis in Squamous cell carcinoma
Unpleasant (अनिष्ट गन्ध)	Fungating wounds in advanced cancers / Vagabond's disease / Infected eczema / Pemphigus / Herpes labialis / Deep pressure sores on buttocks / Infected leg ulcers
Cheesy / Fishy (मत्स्य गन्ध)	Vaginal & cervical bacterial infections
Severe malodour (अनिष्ट गन्ध)	Advanced breast, head and neck cancers
Foul (अनिष्ट गन्ध)	Scarlet fever / Pneumonia / Tuberculosis
Stale beer (अनिष्ट गन्ध)	Ulcerated lymph nodes
Butcher's shop (मृतानि)	Yellow fever
Musty	Phenylketonuria
Acrid / Sweaty feet (स्वेद गन्ध)	Isovaleric academia (IVA)
Yeast / Malt / Hop-like	Methionine malabsorption syndrome

Cabbage like (अनिष्ट गन्ध)	Hypermethioninemia
Foul / Rotten fish like (कुणप गन्ध)	Trimethylaminuria
Rancid butter (अनिष्ट गन्ध)	Tyrosinaemia
Rotten egg (कुणप गन्ध)	Cystinuria
Urine (मूत्र गन्ध)	Uraemia / Kidney failure
Faecal (पुरीष गन्ध)	Ileus / Intestinal obstruction
Putrid (कुणप गन्ध)	Scurvy
Rotting (कुणप गन्ध)	Ozena
Musty / Skunk / Characteristic (गन्धानि अन्यतमानि)	Schizophrenia
Sweaty (स्वेद गन्ध)	Acromegaly
Malodour (अनिष्ट गन्ध)	Liver diseases
Obnoxious (कुणप गन्ध)	Gangrenous feet

REFERENCES:

1. Bhavana KR, Shreevathsa. Medical geography in Charaka Samhita. Ayu. 2014; 35 (4): 371-377. doi: 10.4103/0974-8520.158984. PMID: 26195898; PMCID: PMC4492020.
2. Agrawal M, Byadgi PS, Dwibedy BK. Importance of Ayu Pareeksha for the Management of Diseases. J Clin Diagn Res. 2017; 11 (1): OE01-OE04. doi: 10.7860/JCDR/2017/20881.9144. PMID: 28273996; PMCID: PMC5324441.
3. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 2nd chapter: Pushpitakam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 356-359.
4. Szumilas M. Explaining odds ratios. J Can Acad Child Adolesc Psychiatry. 2010; 19 (3): 227-229. Erratum in: J Can Acad Child Adolesc Psychiatry. 2015; 24 (1): 58. PMID: 20842279; PMCID: PMC2938757.
5. Croskerry P. The importance of cognitive errors in diagnosis and strategies to minimize them. Acad. Med. 2003; 78 (8): 775-780. doi: 10.1097/00001888-200308000-00003
6. Saposnik G, Redelmeier D, Ruff CC, Tobler PN. Cognitive biases associated with medical decisions: a systematic review. BMC medical informatics and decision making. 2016; 16 (1):138. doi: 10.1186/s12911-016-0377-1
7. Lenochova P, Havlicek J. Chemical Signals in Vertebrates 11. Chapter-18 - Human body odour individuality. New York: Springer; 2008, p. 189-198. https://doi.org/10.1007/978-0-387-73945-8_18
8. Havlíček J, Fialová J, Roberts SC. Springer handbook of odor. Chapter-50 - Individual variation in body odor. Cham: Springer; 2017, p. 949-961. https://doi.org/10.1007/978-3-319-26932-0_50
9. Shirasu M, Touhara K. The scent of disease: volatile organic compounds of the human body related to disease and disorder. J. Biochem. 2011; 150 (3): 257-266. doi:10.1093/jb/mvr090
10. Liddell K. Smell as a diagnostic marker. Postgrad Med J. 1976; 52 (605): 136-138.
11. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Vimana sthana - 8th chapter: Roga bhishagjiteeyam vimanam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 277.
12. Kusuhara M, Urakami K, Zangiacomi V, Hoshino K. Disease and smell: "Byoshu". Anti-Aging Medicine. 2010; 7 (6): 66-72. doi: 10.3793/jaam.7.66
13. Wongchoosuk C, Lutz M, Kerdcharoen T. Detection and classification of human body odor using an electronic nose. Sensors. 2009; 9 (9): 7234-7249. doi:10.3390/s90907234
14. Fernández-Grandon GM, Gezan SA, Armour JA, Pickett JA, Logan JG. Heritability of attractiveness to mosquitoes. PLoS One. 2015; 10 (4). e0122716. doi:10.1371/journal.pone.0122716.
15. Verhulst NO, Qiu YT, Beijleveld H, Maliepaard C, Knights D, Schulz S, Berg-Lyons D, Lauber CL, Verduijn W, Haasnoot GW, Mumm R. Composition of human skin microbiota affects attractiveness to malaria mosquitoes. PloS one. 2011; 6 (12). PLoS ONE 6(12): e28991. doi:10.1371/journal.pone.0028991.
16. da Silva Tavares D, Salgado VR, Miranda JC, Mesquita PR, de Medeiros Rodrigues F, Barral-Netto M, de Andrade JB, Barral A. Attraction of phlebotomine sandflies to volatiles from skin odors of individuals residing in an endemic area of tegumentary leishmaniasis. PloS one. 2018; 13 (9): https://doi.org/10.1371/journal.pone.0203989.
17. Mumcuoglu Y, Galun R, Ikan R. The aggregation response of human body louse (Pediculus humanus) (Insecta: Anoplura) to its excretory products. Insect Sci Applic. 1986; 7 (5): 629-632. doi: 10.1017/S1742758400011565.
18. Keswani RK, Bellare JR. A review of mosquito attraction studies: important parameters and techniques. Res. J. Parasitol. 2006; 1: 31-41. doi:10.3923/jp.2006.31.41.
19. Penn D, Potts WK. Chemical signals and parasite-mediated sexual selection. Trends Ecol Evol. 1998; 13 (10): 391-396. doi: https://doi.org/10.1016/S0169-5347(98)01473-6.

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PARIMARSHANEEYAM OF CHARAKA INDRIYA STHANA – AN EXPLORATIVE STUDY

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PARIMARSHANEEYAM OF CHARAKA INDRIYA STHANA – AN EXPLORATIVE STUDY

Abstract:
Samhitas are considered as highly codified store houses of ancient wisdom. The *Charaka samhita* (an ancient Indian textbook of medicine written thousands of years before), as available in its present form consists 8 '*Sthanas'* (sections) and '*Indriya sthana*' (section which deals with prognosis) is one among them. *Indriya sthana* deals with various fatal signs and symptoms which denote imminent death and prognostication of life expectancy in the patients who are at end-of-life stages. *Indriya sthana* of *Charaka samhita* contain 12 chapters and '*Parimarshaneeyam indriyam*' is the 3rd chapter of *Indriya sthana*. '*Parimarshaneeyam indriyam*' chapter contains various *arishta lakshanas* (fatal signs and symptoms which indicates imminent death) which can be elicited by touch or palpation. Various clinical conditions (surgical and ophthalmological) and methods of diagnosing them by using palpation were described in this chapter. The present study is aimed to explore the contents of this chapter and to analyse their role and potential in clinical prognostication. Concepts such as medical ethics & etiquette regarding palpation are mentioned in this chapter. Various pathological technical terms like *'Aspandanm'* (absence of pulsations), '*Darunatvam'* (stony hardness or induration), ' *Kharatvam'* (sclerosis or licehnification or scaling), '*Asat bhava'* (atrophy), *'Sramsa'* (subluxations), *'Bhramsha'* (dislocations), *'Swedanubandha'* (hyperhidrosis), *'Sweda stambha'* (anhidrosis), *'Mamsa shonita veeti bhava'* (cachexia/ sarcopenia /atrophy), ' *Sheetam'* (hypothermia), *'Stabdham'* (rigidity / spasticity), *'Chyuta'* (prolapse), and *'Skanna'* (clotting) etc are mentioned in this chapter along with *arishta lakshanas* related to eyes which are having profound clinical importance. The concepts mentioned in this chapter needs to be standardized. Further research works are required to substantiate the opinions or claims mentioned in this chapter.

Key Words: Atrophy, Hypothermia, Induration, Rigidity, Sclerosis, Spasticity

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INTRODUCTION:

Samhitas are considered as highly codified store houses of ancient wisdom. [1] *Agnivesha* has composed '*Agnivesha samhita'* based on the teaching of his preceptor '*Acharya Punarvasu Atreya*'. Later, *Agnivesha samhita* was elaborated, edited and redacted by *Acharya Charaka* and *Dridhabala*, since then '*Agnivesha samhita'* got popularized as '*Charaka samhita*'. The *Charaka samhita* (an ancient Indian textbook of medicine written thousands of years before), as available in its present form consists 8 '*Sthanas'* (sections) and '*Indriya sthana*' (section which deals with prognosis) is one among them. [2] *Indriya sthana* of *Charaka samhita* contain 12 chapters and '*Parimarshaneeyam indriyam*' is the 3rd chapter of *Indriya sthana*. '*Parimarshaneeyam indriyam*' chapter contains various *arishta lakshanas* (fatal signs and symptoms which indicates imminent death) which can be elicited by touch or palpation. The word *'Parimarshana'* denotes touch or palpation; hence the chapter is named as '*Parimarshaneeyam indriyam*'. In this chapter various clinical conditions (surgical and ophthalmological) and methods of diagnosing them by using palpation were described. [3] The present study is aimed to explore the contents of this chapter and to analyse their role and potential in clinical prognostication.

MAIN CONTENTS:

'प्रकृतिस्थेन पाणिना'

'*Prakrutisthena paaninaa*' [*Verse* 4] [3]

'प्रकृतिस्थेनेति नात्युष्णशीतेन'

'*Prakrutistheneti naatyushnasheetena*' [*Chakrapani*, *Verse* 4] [3]

Palpation is an art of touching a patient in a therapeutic manner to elicit specific information. Prior to palpating a patient, some medical ethics and etiquette needs to be observed (bed side manners). Physician should warm his hands prior to placing them on the patient's body. Palpating with cold hands can make a patient's muscles tense (which can distort assessment findings) and also can cause discomfort to the patient. The word 'प्रकृतिस्थेन पाणिना' denotes the same i.e., physicians hands should be sufficiently warm that they shouldn't cause discomfort to the patient while doing palpation.

'परिमर्शयेद्वाऽन्येन'

'*Parimarshayed vaa anyena*' [*Verse* 4] [3]

'गुरुदारादेः स्वयं स्पर्शो यदा न युज्यते तदा कर्तव्यमाह परिमर्शयेद्वाऽन्येनेति'

'*Gurudaaraade ---- anyeneti*' [*Chakrapani*, *Verse* 4] [3]

If the physician is not allowed (not in a position) to do palpation (due to cultural or religious backgrounds or circumstances which may cause embarrassment or discomfort to the patient), he can get assistance from another person. 'Tacesics' involves tactile

communication and is the study of touch and of the characteristics that are involved, including the gender and age of the communicators (physician and patient), duration, location, action (speed and manner of approach that precede the touch), intensity (pressure exerted), frequency and sensations caused by the touch (degrees of comfort and discomfort generated in the communicating agents). Another aspect when studying tacesics is related to 'where' the person is touched (it influences the degree of embarrassment), context, age, intention and cultural diversity. When performing palpation, the physician should remember that, misinterpretations may occur which may cause embarrassment and discomfort. Therefore, personal factors, communication skills, attitudes, beliefs, values and even technical knowledge must be considered while doing palpation. [4] Before doing palpation physician should be alert regarding various factors like religious or cultural background, gender and part of the body, education level and patient's position in society etc.

'सततं स्पन्दमानानां शरीरदेशानामस्पन्दनम्'

Satatam ---- aspandanam [*Verse* 4] [3]

Diminished or absent pulses in the various arteries examined may be indicative of impaired blood flow due to a variety of conditions. All pulses (brachial, radial, and ulnar arteries of the upper extremities and the femoral, popliteal, dorsalis pedis, and posterior tibial arteries of the lower extremities) should be palpated bilaterally. The aorta and temporal arteries also can be palpated. Diminished pulses are ominous in children and they suggest cardiac failure or shock. Absent or weak pulses in the arm may result from a coarctation of the aorta. If the pulse is of low volume and amplitude (hypokinetic), it suggests low cardiac output in shock or myocardial infarction. Idiopathic dilated cardiomyopathy, valvular stenosis, pericardial tamponade, or constrictive pericarditis can also cause low cardiac output and small peripheral pulses. Absence of a pulse could also suggest an occlusion by thrombus, embolus, or dissection. Unilateral absence of a pulse can aid in the diagnosis of a dissected aortic aneurysm. Intermittent loss of pulse can be seen in cardiac tamponade and cardiac herniation. [5]

'नित्योष्मणां शीतीभावः'

'*Nityoshmaanaam sheeti bhaavaha*' [*Verse* 4] [3]

Spontaneous temperature fluctuations occur commonly in neurological patients. Thermo-dysregulation after spinal cord injury causes dysfunction of the peripheral warm/cold receptors, autonomic control, and sweating mechanisms. Hypothermia can be caused by cold exposure, severe infection, and endocrine abnormalities. Paroxysmal hypothermia with hyperhidrosis (PHH), multiple sclerosis (MS), and Wernicke encephalopathy (WE) are associated with spontaneous episodic hypothermia. Lower body temperatures in patients with infections are associated with an extremely high mortality rate. Hypothermia is one of the most important prognostic factors for poor outcome in trauma patients. Old age, comorbid conditions, and comatose state are associated with an increased incidence of spontaneous hypothermia in patients with brain injury. [6] Two important cutaneous microvascular disorders that may be related to altered reflex or local thermoregulation are 'Raynaud phenomenon' and 'Erythromelalgia'. Reduced vascular density, impaired local vasodilator responsiveness, and reflex sympathetic dysfunction are responsible for above two conditions. [7] Decreased local temperature also suggests ischemia or reduced blood flow to that part.

'मृदूनां दारुणत्वम्'

'*Mrudunaam darunatvam*' [*Verse* 4] [3]

Those structures or body parts which are soft in nature becoming hard or firm on palpation (hard or firm consistency) is considered as *arishta*. For example, on palpation, hard consistency of liver denotes primary or secondary malignancy of liver. On palpation, 'hard but yielding consistency' is found in chondroma, 'bony hard yielding consistency' denotes osteoma, 'stony hard consistency' denotes carcinoma and 'variable consistency' denotes malignancy either carcinoma or sarcoma.

'श्लक्ष्णानां खरत्वम्'

'*Slakshnaanaam kharatvam*' [*Verse* 4] [3]

The word '*Kharatva'* denotes various pathological conditions like fibrosis or sclerosis or hyperplasia or patches or lichenification or scaling etc. Fibrosis is the formation of excess fibrous connective tissue in an organ or tissue. Sclerosis is the stiffening of a tissue or anatomical structure, caused by a replacement of the normal organ-specific tissue with connective tissue. Hyperplasia is enlargement of an organ or tissue caused by an increase in the reproduction rate of its cells, generally seen in the initial stages of cancer. Rough or scaly or patchy skin is observed in various skin conditions like chronic eczema, secondary syphilis, leishmaniasis, onchodermatitis, icthyosis and tuberculoid leprosy etc. Rough skin is also seen in hypothyroidism (myxoedema). '*Kharatva'* also denotes hyperplasia of skin.

'सतामसद्भावः'

'*Sataam asadbhaavaha*' [*Verse* 4] [3]

Atrophy is a process of waste away of body tissue or an organ, due to degeneration. For example, in testicular atrophy the testes shrink due to loss of some germ and leydig cells. Secondary testicular atrophy may occur due to ischemia, carcinoma, mumps orchitis and acquired cryptorchidism. Atrophy of various body parts or organs denotes underlying carcinoma or degenerative processes.

'स्वेदानुबन्धः स्तम्भो वा'

'*Swedaanubandhaha stambho vaa*' [*Verse* 4] [3]

The word 'स्वेदानुबन्धः' denotes excessive sweating (generalized or regional) hyperhydrosis (secondary in the *arishta lakshana's* context). Secondary hyperhydrosis is seen in various conditions like carcinoid, lymphoma, various malignancies, Frey's syndrome, insulinoma, pheochromocytoma, hyperthyroidism, diabetes (due to neuropathy or hypoglycaemia), various infectious diseases, endocarditis, chronic malaria, brucellosis, HIV, vascular deformities and idiopathic unilateral focal hyperhydrosis etc. Horner's syndrome with loss of sweating from one side of the face can cause compensatory hyperhidrosis from the contra lateral side. [8] The word 'स्वेद स्तम्भः' denotes absence of sweating or anhidrosis in which the body does not respond appropriately to thermal stimuli by sweating. Anhidrosis (secondary) can be seen in various conditions like 'Multiple system atrophy' (MSA), Parkinson's disease (PD), Dementia with Lewy bodies (BLD), stroke, Multiple sclerosis (MS), tumours and infections etc which involves autonomic pathways. Anhidrosis is also observed in other conditions such as 'Pure autonomic failure' (PAF), sensory motor polyneuropathy in diabetes, Guillain-Barre's syndrome (GBS), Autoimmune autonomic gangliopathy (AAG), amyloidosis, alcoholic neuropathy, Fabry disease, Ross syndrome, systemic sclerosis, and Acquired idiopathic generalized anhidrosis (AIGA). [9]

'मांसशोणितयोर्वीतीभावः'

'*Maamsa sonithayo veetee bhavaha*' [*Verse* 4] [3]

'वीतीभावः अतिक्षीणत्वम्'

'*Veetee bhavaha ati ksheenatvam*'[*Chakrapani, Verse* 4] [3]

The above condition denotes 'Cachexia'. Cachexia is described as a wasting syndrome involving loss of muscle and fat directly caused by tumour factors, or indirectly caused by an aberrant host response to tumour presence. The etymology of the word cachexia points to its association with poor prognosis and it has long been recognised as a key sign in many cancers. It is a multi-factorial condition which comprises skeletal muscle and adipose tissue loss. Cachexia correlates with poor performance status and quality of life with a high mortality rate in cancer patients. [10] According to a study 'refractory cachexia' develops approximately 90 days before death in cancer patients. Various terms are prevalent related to cachexia like 'cancer cachexia', 'cardiac cachexia', 'pulmonary cachexia', and so on, are generally accepted. Progressive deterioration of nutritional status is frequently observed in patients suffering from acute and chronic diseases. Cachexia also known as disease-associated malnutrition is associated with negative effects on patients' morbidity, mortality and quality of life (QoL). [11] Chronic heart failure (CHF) patients develop a generalized wasting syndrome with extremely poor prognosis termed as 'cardiac cachexia'. Cardiac cachexia in CHF patients is associated with weight loss, loss of lean tissue, gross reduction in fat tissue mass (i.e. energy reserves), reduced bone mineral density (osteoporosis), reduction in total body fat and impaired peripheral blood flow. [12]

'उच्छ्वासोऽतिदीर्घोऽतिह्रस्वो वा'

'*Ucchwaaso ati deergho ati hrasvo vaa*' [*Verse* 6] [3]

There are multiple types of abnormal respiration. They include apnea, orthopnea, dyspnea, hyperpnea, hyperventilation, hypoventilation, tachypnea, Kussmaul respiration, Cheyne-Stokes respiration, sighing respiration, Biot respiration, apneustic breathing, central neurogenic hyperventilation, and central neurogenic hypoventilation etc. Apneustic breathing is is characterized by regular deep inspirations with an inspiratory pause followed by inadequate expiration. This respiratory pattern is often associated with severe brain injury and carries a poor prognosis. [13] Prolonged exhalation ('pursed-lip' in severe cases) caused by chronic intra thoracic obstruction is seen in patients with chronic obstructive pulmonary disease (COPD) (which includes emphysema and chronic bronchitis). Obstructive lung diseases (such as asthma, COPD, cystic fibrosis, bronchiectasis) cause more difficulty with exhaling air. Various abnormal breathing patterns occur due to an underlying cardiac, respiratory or central nervous system pathology.

'मन्ये परिमृश्यमाने न स्पन्दयाताम्'

'*Manye parimrushyamaane na spandayaataam*' [*Verse* 6] [3]

'*Manya'* denotes carotid arteries. Palpation of the carotid arterial pulse provides a clue to the LV (left ventricle) stroke volume; a small pulse suggests a reduced stroke volume, whereas a sharp brief upstroke is often observed in patients with mitral regurgitation (MR) or ruptured ventricular septum with a left-to-right shunt. [5] A weak or impalpable carotid pulse is indicative of severe aortic stenosis. [14] The hypokinetic carotid artery pulse is found in patients with a reduced stroke volume. This group includes patients with hypovolemia, left ventricular failure, and mitral stenosis. [15]

'दन्ताः परिकीर्णाः श्वेता जातशर्कराः'

'*Dantaaha --- jaatasharkaraaha*' [*Verse* 6] [3]

'परिकीर्णा इति मललिप्ता'

'*Parikeernaa iti malaliptaa*' [*Chakrapani, Verse* 6] [3]

The word 'परिकीर्णा' indicates dental plaque, 'श्वेता' indicates chalky white discoloration of teeth and 'जातशर्करा' indicates dental calculus. The presence of clinically detectable, localized areas of enamel demineralization, observed as white spot lesions of different opacity, is a sign that the caries process has begun. The subsurface

porosity caused by demineralization gives the lesion a milky appearance which can be found on the smooth surfaces of teeth. White spot lesions are also seen in fluorosis, hypomineralization, hypomaturation and hypoplasia. [16] Chronic periodontitis is an infectious inflammatory disease caused by the bacteria of the dental plaque, resulting in the progressive destruction of the tissues that support the teeth. Plaque accumulation (परिकीर्णा इति मललिप्ता), calculus formation (जातशर्करा), gingival redness and swelling, gingival bleeding and suppuration may occur spontaneously in periodontitis. Chronic periodontitis is associated with coronary heart disease (CHD), atherosclerotic cardiovascular disease or its sequelae, COPD, bacterial pneumonia, and rheumatoid arthritis. Chronic periodontitis is associated with head and neck squamous cell carcinoma (HNSCC), especially in the oral cavity, followed by the oropharynx and larynx. A significant association was found between the history of periodontitis and risk of developing lung, kidney, pancreas, and hematological cancers. However, the most consistent increased risk was noted in the studies of oral and esophageal cancers and periodontal disease. Gastric and pancreatic cancers had an association with periodontitis in most of the studies. Patients with periodontal disease were more likely to have poorly differentiated oral cavity squamous cell carcinoma (SCC). [17]

'पक्ष्माणि जटाबध्दानि'

'*Pakshmaani jataabaddhaani*' [*Verse* 6] [3]

Matted eyelashes can be seen in 'Blepharitis'. Matted eyelashes may also denote 'Seborrheic deramtitis' (SD). SD often presents as well-defined erythematous plaques with greasy-looking, yellowish scales of varying extents in regions rich in sebaceous glands, such as the scalp, the retro-auricular area, face (nasolabial folds, upper lip, eyelids and eyebrows), and the upper chest. SD is more prevalent in immune-compromised patients such as HIV/AIDS patients and patients with lymphoma. SD is also associated with neurological disorders and psychiatric diseases, such as Parkinson's disease (PD), neuroleptic induced parkinsonism, tardive dyskinesia, traumatic brain injury, epilepsy, facial nerve palsy, spinal cord injury, depression, chronic alcoholic pancreatitis, hepatitis C virus and in patients with congenital disorders such as Down syndrome. [18]

'केशलोमान्यायम्यमानानि प्रलुच्येरन् न चेद्वेदयेयुः'

'*Keshaloma ---- vedayeyuhu*' [*Verse* 6] [3]

'Hypoesthesia' is decreased sensitivity to stimulation whereas 'Hypoalgesia' denotes decreased sensitivity to painful stimuli. [19] Lack of pain sensation while plucking hair denotes various underlying conditions like neuropathies or neuronopathies. Neuropathic disorders encompass those that affect the neuron's cell body or neuronopathies, those affecting the peripheral process, or peripheral neuropathies. The peripheral neuropathies can be broadly subdivided into the myelinopathies and axonopathies. Sensory neuronopathy (ganglionopathy) is seen in cancer (paraneoplastic), idiopathic sensory neuropathy and HIV related neuropathy. Most of the patients with sensory loss associated with peripheral neuropathy (e.g., cryptogenic sensory polyneuropathy or CSPN and diabetes) clinically show diminished light touch, pin, and vibration sensation. [20] Hypoesthesia is also seen in tabes dorsalis, parietal lobe lesions, Brown-sequard syndrome (BSS) and leprosy.

'उदरे सिराः प्रकाशेरञ् श्यावताम्रनीलहरिद्रशुक्ला वा'

'*Udare siraaha ---- shuklaa vaa*' [*Verse* 6] [3]

Enlarged tortuous superficial abdominal veins are seen in various conditions like IVCS (inferior vena cava syndrome), hepatic sarcoidosis, portal hypertension, cirrhosis of liver with caput medusae, alcoholic liver disease, Budd chiari syndrome, and spider nevi in hepatitis C etc.

'नखाः वीतमांसशोणिताः पक्वजाम्बववर्णाः'

'*Nakhaa --- varnaaha*' [*Verse* 6] [3]

Discoloration of nails (purple or blue or black) along with atrophy denotes various underlying systemic diseases. Cyanosis may manifest as blue or purple discoloration of the nail bed and digits due to lower oxygen saturation causing accumulation of deoxyhemoglobin in the small blood vessels of the extremities. Central cyanosis is caused by congenital heart diseases whereas peripheral cyanosis is caused by vasoconstriction and diminished peripheral blood flow due to exposure to cold, shock, congestive cardiac failure, and peripheral vascular disease. Melanonychia (brown or black lines on nails) may be due to an underlying melanocytic nevus or malignant melanoma, hemochromatosis, malnutrition, thyroid disease, smoking, HIV infection, and Addison's disease. [21] Vasoreactive individuals often have a perniotic circulation, especially at the hands and feet (acroperniosis). At rest, a perniotic circulation is characterized by a cold purplish (पक्वजाम्बववर्ण) periphery. In perniosis, cold can cause vasoconstriction severe enough to induce temporary distal ischaemia. This prolonged vasoconstriction would be able to cause prolonged relative hypoxia at the periphery which may cause pulp atrophy (वीतमांसशोणित) and secondary curvature and hyperplasia of finger nails. [22] The purplish discoloration along with atrophy of nails denotes ischemia or gangrene.

'अंङ्गुलय आयम्यमाना न स्फुटेयुः'

'*Angulaya ---- na sphuteyu*' [*Verse* 6] [3]

Loss of ability to crack one's knuckles is one of the manifestations of hyperparathyroidism. Soft tissue calcification in secondary hyperparathyroidism reduces tendon elasticity and restricts finger joint motion. This limitation reduces the vacuum and

cavitation caused by phalanx flexion, and thereby attenuates or eliminates the audible 'pop' or cracking of the knuckles. Articular and other musculoskeletal manifestations of secondary hyperparathyroidism have been a longstanding concern for patients with chronic kidney disease. [23] Benign joint hypermobility syndrome (BJHS) is characterized by generalized joint laxity and hypermobility. Hypermobility may occur in several different connective tissue disorders including Marfan syndrome, Ehlers–Danlos syndrome (EDS), and osteogenesis imperfecta, Down syndrome, metabolic disorders (homocystinuria and hyperlysinemia) and Juvenile rheumatoid arthritis. [24]

'सन्धीनां स्रंसभ्रंशच्यवनानि'

'*Sandheenaam --- chyavanaani*' [*Verse* 4] [3]

स्रंसः मनाग्गमनम् । भ्रंशस्तु सुदूराधोगमनम् । धावनं तु पार्श्वतो गमनम् ॥

'*Sramsaha --- gamanam*' [*Chakrapani*, *Verse* 4] [3]

The word 'स्रंसः' denotes subluxation (subluxation of temporomandibular joint or TMJ), 'भ्रंशः' denotes dislocation (shoulder dislocation) and 'धावनं' denotes deviation (ulnar deviation in rheumatoid arthritis) or varus or valgus deformities (genu valgum & genu varum) of various joints. Generalized joint laxity is characterized by increased length and elasticity of normal joint restraints, resulting in an increased range of motion and increased distractibility. This hyperlaxity can be congenital and acquired. Congenital hyperlaxity is caused by connective tissue disorders, such as Ehlers-Danlos syndrome, Marphan syndrome, osteogenesis imperfecta, and benign hypermobility syndrome. Acquired joint hyperlaxity is seen in athletes (swimmers, gymnasts, pitchers, etc). The term "multidirectional instability" (MDI) is defined as symptomatic involuntary instability of the glenohumeral joint in more than one direction (anterior and/or posterior, and inferior). [25] Hypermobility is seen in various conditions like 'Benign joint hypermobility syndrome' (BJHS), Marfan syndrome, 'Ehlers–Danlos syndrome' (EDS), and osteogenesis imperfecta, 'Down syndrome', metabolic disorders (homocystinuria and hyperlysinemia) and 'Juvenile rheumatoid arthritis'. [24]

'तस्य चेत् परिमृश्यमानं पृथक्त्वेन पाद जंघोरु स्फिगुदर पार्श्व पृष्ठेषिका पाणि ग्रीवा तालोष्ठ ललाटं स्विन्नं शीतं स्तब्धं दारुणं वीतमांसशोणितं वा स्यात्'

'*Tasya chet --- vaa syaat*' [*Verse* 5] [3]

Various pathological findings like 'स्विन्नम्' (Secondary hyperhydrosis either generalized or localized seen in various conditions like carcinoid, lymphoma, malignancies, insulinoma, pheochromocytoma, hyperthyroidism, diabetes, infectious diseases, endocarditis, brucellosis, HIV, vascular deformities, idiopathic unilateral focal hyperhydrosis and Horner's syndrome etc), [8] 'शीतम्' (Generalized or localized hypothermia due to various conditions like ischemia, erythromelalgia, reflex sympathetic dysfunction, Raynaud phenomenon, brain injury or severe trauma, Wernicke encephalopathy, Multiple sclerosis, paroxysmal hypothermia with hyperhidrosis, severe infections and endocrinal abnormalities etc), [6&7] 'स्तब्धम्' (Hypertonia or rigidity or spasticity etc seen in diseases of basal ganglia or extrapyramidal system such as parkinsonism, Huntington's disease, dystonia, Tourette syndrome, Wilson's disease, blepharospasm, and other conditions like fibromyalgia, hypothyroidism, tetanus, epilepsy, and frozen shoulder etc), 'दारुणम्' (Stony hardness seen in carcinoma or sarcoma) and 'वीतमांसशोणितम्' (Pulmonary, cardiac and cancer cachexia or atrophy seen in carcinoma and various other chronic debilitating diseases) occurring spontaneously (without any visible or known reason or cause) at various parts of the body (feet, legs, thighs, buttocks, abdomen, spine, ribs, neck, hands, palate, lips and forehead) denote *Arishta lakshana's*.

'तस्य चेत् पृथक्त्वेन गुल्फ जानु वंक्षण गुद वृषण मेढ्रनाभ्यंसस्तन मणिक पर्शुका हनु नासिका कर्णाक्षि भ्रू शङ्खादीनि स्रस्तानि व्यस्तानि च्युतानि स्थानेभ्यः स्कन्नानि वा स्युः'

'*Tasya chet --- vaa syuhu*' [*Verse* 5] [3]

Manifestation of various pathological features (spontaneously without any known cause) like, 'स्रस्त' (subluxation or dislocation or laxity or flaccidity), 'व्यस्त' (altered or dispersed or seperated), 'च्युत' (prolapsed or fallen or dropped), and 'स्कन्न' (trickled down or emitted or thickening or clotting) at various body parts (ankle, knee, inguinal, anus, testicles, penis, umbilicus, wrist, breast, shoulder, ribs, jaw, nose, ears, eyes, eyebrows and temple region) indicates or denote *Arishta* (Table 1).

'तस्य चेच्चक्षुषी प्रकृतिहीने विकृतियुक्ते अत्युत्पिण्डिते अतिप्रविष्टे अतिजिह्मे अतिविषमे अतिमुक्तबन्धने अतिप्रसृते सततोन्मिषिते सततनिमिषिते निमिषोन्मेषातिप्रवृत्ते विभ्रांतदृष्टिके विपरीतदृष्टिके हीनदृष्टिके व्यस्तदृष्टिके नकुलान्धे कपोतान्धे अलातवर्णे कृष्णपीतनीलश्यावताम्रहरितहरिद्रशुक्लवैकारिकाणां वर्णानामन्यतमेनातिप्लुते वा स्यातां तदा परासुरिति विद्यात्'

'*Tasya chet ---- vidyaat*' [*Verse* 6] [3]

Various *aristha lakshana's* related to *netra* (eye) are explained in the above verse (Table 2).

CONCLUSION:

Some medical ethics & etiquette regarding palpation are mentioned in this chapter. The importance of proper knowledge or training regarding identification of *Arishta lakshana's* is essential and it makes the physician confident while prognosticating and minimizing personal biases. Concepts such as medical ethics & etiquette regarding palpation are mentioned in this chapter. Various pathological technical terms like '*Aspandanm'* (absence of pulsations), '*Darunatvam'* (stony hardness or induration), ' *Kharatvam'* (sclerosis or licehnification or scaling), '*Asat bhava'* (atrophy), *'Sramsa'* (subluxations), *'Bhramsha'* (dislocations),

'Swedanubandha' (hyperhidrosis), *'Sweda stambha'* (anhidrosis), *'Mamsa shonita veeti bhava'* (cachexia / sarcopenia / atrophy), *' Sheetam'* (hypothermia), *'Stabdham'* (rigidity / spasticity), *'Chyuta'* (prolapse), and *'Skanna'* (clotting) etc are mentioned in this chapter along with *arishta lakshanas* related to eyes which are having profound clinical importance. The concepts mentioned in this chapter needs to be standardized. Further research works are required to substantiate the opinions or claims mentioned in this chapter.

Table 1: ***Sparshagata Arishta lakshanas***

Part of the body	Relevant conditions
गुल्फ (Ankle)	Foot drop / Functional or chronic ankle instability / Predislocation syndrome / Subluxations and dislocations of ankle joint / Inflammatory joint disease / Multiple sclerosis / Amyotrophic lateral sclerosis / Charcot-Marie-Tooth disease etc
जानु (Knee)	Subluxation & dislocation of patella / Genu valgum & varum / Rickets / Inflammatory joint diseases / Rupture of quadriceps tendon
वंक्षण (Inguinal or Hip)	Acetabular rim syndrome / Avascular necrosis / Hip dysplasia / Labral tears / Dislocation of hip / Femoroacetabular impingement (FAI) / Acetabular dysplasia / Poliomyelitis / Femoral neck fracture (due to osteoporosis)
गुद (Anus)	Rectal prolapse or Procidentia / Adenocarcinoma of rectum or sigmoid colon / Rectosigmoid tumour / Ischio rectal abscess etc
वृषण (Testicle / Scrotum)	Acquired cryptorchidism / Testicular torsion / various tumours of testes / Anteversion and inversion of testis etc
मेढ्र (Penis)	Peyronie's disease / Lichen sclerosis / Fournier's gangrene / Buried penis / Idiopathic partial thrombosis of corpus cavernosum (IPT) / Ischemic priapism etc
नाभि (Umbilicus)	Exomphalos / Umbilical or paraumbilical hernias / Everted umbilicus due to intra abdominal neoplasms etc
अंस (Shoulder)	Subluxation & dislocation of shoulder / winging of the scapula / Sprengel's deformity / Glenohumeral joint dysplasia / Rotator cuff disease (RCD) / Adhesive capsulitis (frozen shoulder) / Subacromial impingement syndrome (SIS) / Labral tears etc
स्तन (Breast)	Benign tumours and carcinoma of breast / Retracted, deviated, inverted and flattened nipples (due to abscess or neoplasms)
मणिक (Wrist)	Radial or ulnar deviation / Flexion deformity / Rheumatoid hand / Madelung's deformity / Preiser's disease / Kienbock's disease / Ligament tears / Motor neuron disease (MND) / Wrist drop / Varus and Valgus deformities of wrist / Rickets / Lunate or perilunate dislocations etc
पर्शुक (Rib)	Metastatic rib lesions / Gorham disease / Chondrosarcoma / Fibrous dysplasia / Rib fractures / Cervical rib / Paget disease / Kyphosis / Scoliosis / Rachitic rosary etc
हनु (Jaw)	Subluxation or dislocation or ankylosis of TMJ (Temporomandibular joint) / Trismus / Oromandibular dystonia
नासिक (Nose)	Saddle nose / Septal deviation / Sinonasal tumours / Rhinoscleroma / Leprosy / Nasal polyps etc
कर्ण (Ear)	Protruding or bat ears / Cup shaped or low-set ears in Down syndrome / Cauliflower ears / Mastoid abscess / Ear tumours
अक्षि (Eye)	Exophthalmos (in Graves' disease) / Enophthalmos / Squint / Retro orbital or orbital tumours / Ophthalmoplegia etc
भ्रू (Eyebrow)	Madarosis / Facial nerve palsy / Horner syndrome / Myasthenia gravis / Brow tumours like pleomorphic adenoma etc
शङ्ख (Temple region)	Multiple venous malformations with phleboliths at temples / Giant cell arteritis / Intra cranial abscess / Temporal osteitis or myositis / Multiple myeloma / Maxillary carcinoma etc

Table 2: ***Netragata Arishta lakshanas***

Arishta lakshana	Relevant conditions
अत्युत्पिण्डिते (Exophthalmos)	Graves ophthalmopathy / Retro orbital or orbital tumours / Orbital cellulitis / Severe glaucoma etc
अतिप्रविष्टे (Enophthalmos)	Horner's syndrome / Marfan syndrome / Duane's syndrome / Silent sinus syndrome / Phthisis bulbi / Atrophy etc
अतिजिह्मे (Crossed eyes)	Squint or Strabismus / Acquired paralytic strabismus in Diabetes / Graves disease / Guilain-Barre syndrome (GBS) / Stroke / Brain tumours / Hydrocephalus / Cerebral palsy etc
अतिविषमे (Uneven)	Irregular astigmatism / Keratoconus / Central cornea islands / Map-Dot-Fingerprint dystrophy (MDF) / Cysts or tumours in one eye etc
अतिमुक्तबन्धने (Plegia)	Ophthalmoplegia / Myasthenia gravis / GBS / Kearns-Sayre syndrome / Foville's syndrome / Internuclear ophthalmoplegia / Multiple sclerosis / Parinaud's syndrome / Stroke / Wernicke encephalopathy / Cavernous sinus syndrome / Paralysis of cranial nerves (CN III, IV & VI) etc
अतिप्रसृते (Watering eyes)	Epiphora / Allergic or infective conjunctivitis / Trichiasis / Ectropion / Keratitis / Corneal ulcers / Chalazion / Bell's palsy / Dacrocystitis / Punctal eversion / Stevens-Johnson syndrome / Neoplasms etc

सततोन्मिषिते (Lagophthalmos)	Lagophthalmos / Symblepharon formation / Acquired oculomotor synkinesis / Exophthalmos / Facial palsy / Ectropion etc
सततनिमिषिते (Drooping / Ptosis)	Ptosis / Ocular myopathies / Horner's syndrome / Cranial nerve palsy (CN III) / Myasthenia gravis / Stevens-Johnson syndrome / Atrophy etc
निमिषोन्मेषातिप्रवृत्ते (Excessive blinking)	Corneal abrasion / Trichiasis / Inflammatory or allergic conditions of eyes / Benign essential blepharospasm / Meige syndrome / Tics etc
विभ्रांतदृष्टिके (Dancing eyes)	Nystagmus / Cataracts / Strabismus / Meniere's disease / Multiple sclerosis / Stroke / B_{12} or Thiamine deficiencies / Brain tumours etc
विपरीतदृष्टिके (Distorted vision)	Metamorphopsia / Age related macular degeneration / Astigmatism / Keratoconus / Glaucoma / Migraine / Epiretinal membrane etc
हीनदृष्टिके (Defective vision)	Central retinal artery or vein occlusion / Ischemic optic neuropathy / Vitreous haemorrhage / Retinal detachment / Acute glaucoma / Transient ischemic attack / Tumours or infections in brain etc
व्यस्तदृष्टिके (Oscillopsia)	Seizures / Multiple sclerosis / Superior oblique myokymia / Stroke / Meningitis / Brain tumours / Meniere's disease etc
नक्तान्धे (Nyctalopia)	Congenital high myopia / Tapeto-retinal degeneration / Glaucoma / Cataract / Diabetes / Retinitis pigmentosa / Vitamin A deficiency etc
कपोतान्धे (Hamarlopia)	Cone dystrophy / Achromatopsia / Central lenticular opacity / Central cataracts / Cancer associated retinopathy (CAR) etc
अलातवर्णे (Bloodshot eyes)	Chemosis / Various inflammatory & allergic conditions / Acute conjunctivitis / Sub conjunctival haemorrhage / Glaucoma etc
अन्य वैकारिक वर्णानि (Eye discoloration)	Panda eye / Jaundice / Heterochromia iridis / Iris nevi / Pigment dispersion syndrome / Horner's syndrome / Osteogenesis imperfecta / Arcus senilis / Keyser Fleischer ring in Wilson's disease etc

REFERENCES:

1. Vishwakarma R, Goswami PK. A review through Charaka Uttara-Tantra. Ayu. 2013; 34 (1): 17-20. doi: 10.4103/0974-8520.115438. PMID: 24049400; PMCID: PMC3764873.
2. Murlidhar P, Byadgi PS. Charaka - The great legendary and visionary of Ayurveda. Int J Res Ayurveda Pharm. 2011; 2 (4): 1011-1015.
3. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 3rd chapter: Parimarshaneeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 357-358.
4. Schimidt TC, Silva MJ. An approach to touching while providing high-quality affective health care to hospitalized elderly patients. Rev Esc Enferm USP. 2013; 47 (2): 426-432. Available from: http://www.scielo.br/pdf/reeusp/v47n2/en_22.pdf
5. Maddury J. Arterial pulse. Indian Journal of Cardiovascular disease in Women. 2017; 2 (4): 99-110. doi: https://doi.org/10.1055/s-0038-1636691
6. Wang B, Mustroph ML, Wang H (2016) Spontaneous Body Temperature Fluctuations in Neurological Patients. J Neurol Neurobiol 2 (4): doi http://dx.doi.org/10.16966/2379-7150.127
7. Charkoudian N. Skin blood flow in adult human thermoregulation: How it works, when it doesn't, and why? Mayo Clin Proc. 2003; 78: 603-612. https://doi.org/10.4065/78.5.603
8. Rystedt A, Brismar K, Aquilonius SM, Naver H, Swartling C. Hyperhidrosis – an unknown widespread "silent" disorder. J Neurol Neuromedicine 2016; 1 (4): 25-33. Available from: https://www.jneurology.com/articles/hyperhidrosis--an-unknown-widespread-silent-disorder.html
9. Park KH, Park KJ. Neurological aspects of anhidrosis: differential diagnoses and diagnostic tools. Ann Clin Neurophysiol 2019; 21 (1): 1-6. doi: https://doi.org/10.14253/acn.2019.21.1.1
10. Donohoe CL, Ryan AM, Reynolds JV. Cancer cachexia: mechanisms and clinical implications. Gastroent Res Pract. 2011; 2011. Article ID 601434. doi:10.1155/2011/601434
11. Laviano A, Paldino A. Diagnosing cachexia. Clin Pract. 2014; 11 (1): 71-78. doi: 10.2217/CPR.13.87
12. Sharma R, Anker SD. From tissue wasting to cachexia: changes in peripheral blood flow and skeletal musculature. Eur Heart J Supplements 2002; 4 (Suppl D): D12-D17.
13. Whited L, Graham DD. Abnormal Respirations. [Updated 2019 Jul 30]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470309/
14. Sachithanandan A, Bonde P, MacGowan SW. An absent carotid pulse may indicate critical aortic stenosis. Interact Cardiovas Thorac Surg 2002; 1 (2): 81 82. https://doi.org/10.1016/S1569-9293(02)00059-2
15. Morris DC. The carotid pulse. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition. Boston: Butterworths; 1990. Available from: https://www.ncbi.nlm.nih.gov/books/NBK312/
16. Alshehri A, Kwon SR. Etiology and management of white spot lesions. Decisions in dentistry. 2016. Available from: https://decisionsindentistry.com/article/lesions-0116/
17. Arigbede AO, Babatope BO, Bamidele MK. Periodontitis and systemic diseases: A literature review. J Indian Soc Periodontol. 2012; 16 (4): 487-491. doi: 10.4103/0972-124X.106878. PMID: 23493942; PMCID: PMC3590713.
18. Borda LJ, Wikramanayake TC. Seborrheic Dermatitis and Dandruff: A Comprehensive Review. J Clin Investig Dermatol. 2015; 3 (2): 10.13188/2373-1044.1000019. doi: 10.13188/2373-1044.1000019. PMID: 27148560; PMCID: PMC4852869.
19. Pickering AE. An overview of neuropathic pain. Br. J. Anaesth. 2002; 2 (3): 65-68. Available from: https://bjaed.org/article/S1472-2615(17)30088-2/pdf
20. Barohn RJ, Amato AA. Pattern-recognition approach to neuropathy and neuronopathy. Neurol Clin. 2013; 31 (2): 343-361. doi: 10.1016/j.ncl.2013.02.001. PMID: 23642713; PMCID: PMC3922643.
21. Singal A, Arora R. Nail as a window of systemic diseases. Indian Dermatol Online J. 2015; 6 (2): 67-74. doi: 10.4103/2229-5178.153002. PMID: 25821724; PMCID: PMC4375768.
22. Payne-James JJ, Munro MH, Payne CR. Pseudosclerodermatous triad of perniosis, pulp atrophy and 'parrot-beaked'clawing of the nails–a newly recognized

syndrome of chronic crack-cocaine use. J. Forensic. Leg. Med. 2007; 14 (2): 65-71. doi:10.1016/j.jcfm.2006.01.013
23. Ross EA, Paugh-Miller JL, Nappo RW, Knuckle cracking: secondary hyperparathyroidism and what your mother did not tell you. Clin Kidney J 2013; 6 (6): 671–673. doi: https://doi.org/10.1093/ckj/sft123
24. Simpson MMR. Benign Joint Hypermobility Syndrome: Evaluation, Diagnosis, and Management. J Am Osteopath Assoc 2006; 106 (9): 531–536. Available from: https://www.ncbi.nlm.nih.gov/pubmed/17079522
25. Saccomanno MF, Fodale M, Capasso L, Cazzato G, Milano G. Generalized joint laxity and multidirectional instability of the shoulder. Joints. 2014; 1 (4): 171-179. doi: 10.11138/jts/2013.1.4.171. PMID: 25606530; PMCID: PMC4295707.

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INDRIYAANEEKAM OF CHARAKA INDRIYA STHANA - AN EXPLORATIVE STUDY

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REVIEW ARTICLE

INDRIYAANEEKAM OF CHARAKA INDRIYA STHANA- AN EXPLORATIVE STUDY

Abstract:
'Indriyaaneekam indriyam' is the name of the fouth chapter of *Charaka samhita* (an ancient Indian textbook of medicine), *Indriya sthana* (one among the eight secions of *Charaka samhita*, which deals with prognostic aspects). *Indriya sthana* of *Charaka samhita* consists of various fatal signs and symptoms which denote imminent death and prognostication of life expectancy in dying patients. *Indriyaaneekam indriyam* deals with various fatal perceptual abnormalities which denote imminent death. The present study is aimed to explore the contents of '*Indriyaaneekam indriyam*' chapter and to analyse their role and potential in contemporary clinical prognostication. Various illusions, hallucination and perceptual abnormalities related to sensory organs have been explained in this chapter which are having prognostic significance. Various *arishta lakshanas* (fatal signs and symptoms which denote imminent death) explained in this chapter denotes distortion of perception and cognition, illusions, and hallucinations due to an underlying latent or subclinical pathology at CNS (central nervous system) and/or PNS (peripheral nervous system). Manifestation of *Arishta lakshanas* explained in this chapter is due to '*Indriya buddhi vibhrama*' (Agnosias) and pathology at the level of '*Indriyavaha* or *manovaha* or *buddhi vaha srotas*' or at the seat of '*Indriya buddhi'*. Conditions like 'Visual perceptual distortions' (VPDs), 'Neurocognitive disorders' (NCDs), concepts of 'Neuroplasticity', 'Synesthesia', and 'Phantom perception', 'Organic psychosis', and 'Extra sensory perception' (ESP) etc are mentioned in this chapter. Further research works are required to substantiate the clinical experiences mentioned in this chapter in terms of their validity, reliability, generalizability and clinical applicability in contemporary medical practice and also to establish the association between the manifestations of *arishta lakshanas* with death.

Key Words: Agnosia, Illusions, Neurocognitive disorders, Neuroplasticity, Organic psychosis, Visual perceptual distortions

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INTRODUCTION:

'*Charaka Samhita'* is one of the most revered and followed classical text of *Ayurveda* considered as the treasure trove of the basic principles of *Ayurveda* and a rich literary source for research activity. '*Charaka Samhita*' is divided into eight sections known as '*Sthana'* which are again divided into specific number of '*Adhyaya'* or chapters. The total number chapters in the '*Charaka Samhita'* are 120. [1] *Indriya sthana* is one among the eight sections of *Charaka samhita* which deals with prognosis. *Indriya sthana* consist of the description of various *Arishta lakshanas* (fatal signs and symptoms) which indicates imminent death. *Arishta lakshanas* are the signs and symptoms which denotes the definite death of the patient. [2]

Indriyaaneekam indriyam is the name of the fourth chapter of *Charaka samhita*, *Indriya sthana*. *Indriyaaneekam indriyam* deals with various fatal signs and symptoms pertaining to perception which denotes imminent death. Various illusions, hallucination and perceptual abnormalities related to sensory organs have been explained in this chapter which are having prognostic significance. Various *arishta lakshanas* (fatal signs and symptoms which denote imminent death) explained in this chapter denotes distortion of perception and cognition, illusions, and hallucinations due to an underlying latent or subclinical pathology at CNS (central nervous system) and/or PNS (peripheral nervous system). [3] The present study is aimed to explore the various contents of '*Indriyaaneekam indriyam*' chapter and to analyse their role and potential in contemporary clinical prognostication.

MAIN CONTENTS:

स्वस्थेभ्यो विकृतं यस्य ज्ञानमिन्द्रियसंश्रयम् आलक्ष्येतानिमित्तेन लक्षणं मरणस्य तत्।

Swasthebhyo --- maranasya tat [*Verse* 5] [3]

स्वस्थेभ्य इति प्रकृतिस्तेभ्य इन्द्रियेभ्यः। इन्द्रियसंश्रयमिति बाह्येन्द्रियजन्यम्।
अनिमित्तेनेति विकृतिज्ञानजनक बाह्यहतुेव्यतिरेकेण॥

Swasthebhyo --- vyatirekena [*Chakrapani*, *Verse* 5] [3]

Without any known or visible cause (विकृतिज्ञानजनक बाह्यहतुेव्यतिरेकेण), manifestation of perceptual abnormalities or distortions (विकृतं यस्य ज्ञानम्) in a healthy person with normal *indirya's* (sensory organs) (प्रकृतिस्तेभ्य इन्द्रियेभ्यः), indicates impending death (लक्षणं मरणस्य). *Ayurveda* considers *Buddhi* (intellect / cognition) as a separate entity which works in collaboration with the *Manas* (mind). *Buddhi* is considered as the organ of perception and it provides confirmative knowledge after proper analysis. It has been mentioned in *Ayurveda* that the *gyanendriya's* (sensory organs) comes in contact with their respective *indriyartha's* (sensory stimuli) in the presence of *manas* (mind) for gaining the corresponding knowledge after the analysis done by

indriya buddhi's. *Pancha indriya buddhi's (chakshu buddhi, Shrotra buddhi, Ghraana buddhi, Rasana buddhi and Sparshana buddhi*) are responsible for *pancha indriya gyana* (perception). For example, '*Chakshu buddhi'* helps in seeing or perceiving or identifying different objects with different shapes, colours and sizes. Functions of *pancha indriya buddhis'* resembles with the functions of association cortices of the brain and the pathological states of *indriya buddhi's* denote different types of Agnosia. [4]

The content of visual perceptual experience (whether an object, a face, motion, etc) localises activity to a particular brain region or network, irrespective of whether the experience is a normal percept, illusion, hallucination, etc. Each visual perceptual symptom comes under one of four classes of dysfunction (topological versus hodological; 'hyper' versus 'hypo' function/connection). Visual symptoms like illusions, hallucination and visual perceptual distortions (VPDs) (विकृतं यस्य ज्ञानम्) are commonly seen in different psychiatric or neuro-developmental disorders. Topological disorders (pathology at the level of मनस् & बुध्दि / इन्द्रियबुध्दि) are localised within a cortical area and they manifests as either a loss or deficit (hypofunction) (क्षय) or an increase in function (hyperfunction) (वृध्दि). Hodological disorders (pathology at इन्द्रियवह, मनोवह & बुध्दिवह स्रतस्) relate to connections between areas of the brain, including those in which function in one brain region is altered by changes in another, spatially remote, region. Connections between areas can be decreased (disconnection) (क्षय) or increased (hyperconnection) (वृध्दि) in hodological disorders. Hence the 'arishta lakshna's explained in this chapter comes under 'Hodotopic framework' where the pathology lies at various parts of the brain or connections between different parts of the brain (sensory organs are structurally normal) (प्रकृतिस्तेभ्य इन्द्रियेभ्यः) and the underlying diseases causing those pathology may be latent or subclinical (अनिमित्तेनेति). [5]

***Arishta lakshana's* related to vision (Table 1):**

घनीभूतमिवाकाशमाकाशमिव मेदिनीम्। विगीतमुभयं ह्येतत् पश्यन् मरणमृच्छति॥

Ghaneebhuta --- maranamrucchhati [*Verse* 7] [3]

विगीतमिति विपरीतत्वेन ज्ञातम्।

Vigeetamiti --- gnaatam [*Chakrapani*, *Verse* 7] [3]

Perceiving sky (low density object) as earth (high density object) and earth or soil as sky is considered as '*Arishta lakshana*', if it occurs without any cause. The word 'विगीतमिति विपरीतत्वेन', denotes various visual symptoms like illusions, hallucination and visual perceptual distortions (VPDs). There are plenty of visual illusions, hallucination and VPDs are identified; some among them are,

Achromatopsia: Partial or total loss of colour vision

Hyperchromatopsia: Colours appears as bright, highly saturated, or luminescent by which objects have a glittering appearance

Akinetopsia: Selective loss of a motion vision

Prosopagnosia: Face blindness or inability to recognize faces

Environmental agnosia: Inability to recognize familiar places

Metamorphopsia: Distorted vision / size or object distortions

Macropsia: Objects appearing larger

Micropsia: Objects appearing smaller

Pelopsia: Objects appearing nearer

Teleopsia: Objects appearing further away

Enhanced stereopsis: Disorder of depth perception

Apperceptive agnosia: Cortical blindness characterized by diffuse visual loss

Scieropia: Objects seen appear to be in a shadow

Gnosanopsia: Visual percept without the ability to discriminate

Agnosopsia: Blindspot or having intact discrimination ability without visual percept

Simultanagnosia: An inability to sustain attention across different locations in visual field

Visual anoneria: Loss of visual imagery or a specific loss of visual dreaming

Visual snow: Visual static or seeing white or black dots in parts or whole of the visual field

Photopsia: Presence of perceived flashes of light in the field of vision

Teichopsia: Zigzag lines and patterns in the visual field

Prosometamorphopsia: Illusion of distorted faces

Intermetamorphosis: Change in the visually perceived identity of a face

Palinopsia: Persistent recurrence of a visual image after the stimulus has been removed

Polyopia: Perceiving multiple copies of the same object

Visual anosognosia: Denial of blindness in the context of cortical blindness

Confabulations: False memories or false reports of visual perceptual experience

Oculogravic illusion: An illusory displacement of objects co-occurring with a change in gravity as in a diving airplane. [5-9]

Deficit (hypofunction) and disconnection disorders of visual perception are found in stroke, intracranial compressing masses or SOLs (space occupying lesions), neurosurgical procedures, demyelinating disorders, neuro-developmental conditions like autism, neurodegenerative disease, schizophrenia and depression. Hyperfunction and hyper connection disorders of visual perception are found in ophthalmic diseases, neurodegenerative disease, Parkinson's disease, psychosis, epilepsy and side effects of alcohol or medication. [5] The pathology mentioned in the above verse indicates VPDs or visual illusions or

hallucinations or metamorphopsia due to a latent or subclinical underlying neurological disorder (especially pathology involving occipital or occipito-parietal or occipito-temporal lobes or retina).

यस्य दर्शनमायाति मारुतोऽबरगोचरः। अग्निर्नायाति चादीप्तस्तस्यायुःक्षयमादिशेत॥

Yasya darshana --- aadishet [*Verse* 8] [3]

दर्शनमिति चक्षुर्गोचरताम्।

Darshana --- gocharataam [*Chakrapani*, *Verse* 8] [3]

'दर्शनमायाति मारुतो' denotes visual hallucinations whereas 'अग्निर्नायाति चादीप्तम्' indicates achromatopsia or dyschromatopsia or inability to discriminate the hue or luminance of colours. Visual hallucinations can be defined as the perception of an object or event in the absence of an external stimulus (दर्शनमायाति मारुतो), which are experienced by patients with conditions that span several fields (e.g., psychiatry, neurology, and ophthalmology). Visual hallucinations are found in various conditions like seizures, occipital lobe lesions (tumours or vascular lesions), psychosis (schizophrenia and schizoaffective disorder), delirium, dementia, Charles Bonnet syndrome (CBS), Anton's syndrome, Migraine, tumours in temporal lobe, Creutzfeldt-Jakob disease (CJD), Parkinson's disease, and posterior cortical atrophy etc. [10]

Generally, patients with achromatopsia (loss of colour vision) report that the world appears as if it has been drained of colour and even bright, saturated colours look pale (अग्निर्नायाति चादीप्तम्). Patients cannot perceive, name and/or sort any colour, although they are still able to sort shades of gray. Hemi-achromatopsia is associated with lesions in the territory of the posterior cerebral arteries, the occipito-temporal portion of the brain, often involving regions at or near the occipital pole: the lingual and fusiform gyri (human V4). [11] A significantly larger proportion of AD (Alzheimer's disease) patients have shown inability to discriminate between blue and violet hues. Scieropia refers to darkening of vision and follows diffuse occipital damage (a patient whose vision is dimmed as if seeing everything at twilight). The same symptom occurring without other visual impairments (scierneuropsia) was described in the psychoanalytic literature and is likely to be an example of de-realisation. [5]

जले सुविमले जालमजालावतते नरः। स्थिते गच्छति वा दृष्ट्वा जीवितात् परिमुच्यते॥

Jale suvimale --- parimuchyate [*Verse* 9] [3]

Myodesopsia (eye floaters) is a common complaint in ophthalmologic clinics. Most patients described the floaters as spots, threads, hair-like, hollow circles, or cobwebs (जालम्), with or without flashes. These symptoms are usually secondary to degenerative changes (liquefaction) in the vitreous body. The liquefied vitreous fluid may leak out from the vitreous body and make posterior vitreous surface separated from retina, leading to posterior vitreous detachment (PVD).[12] The word 'जले सुविमले' denotes that, the cobweb like eye floaters are visible clearly on plain backgrounds. Myodesopsia is seen in various conditions like optic neuritis, as a symptom in central nervous system blast crisis in chronic myeloid leukemia, [13] vitreous syneresis, retinal detachments, regression of the hyaloids artery, vitritis, and cystoids macular edema etc. Statokinetic dissociation (SKD), which is often called Riddoch phenomenon or Riddoch syndrome, is the ability to perceive visual motion consciously in a blind visual field (स्थिते गच्छति वा) and has been observed in individuals with lesions in the anterior visual pathways or the occipital lobe or in posterior cortical atrophy (PCA).[14] The Riddoch syndrome is a variant of cortical blindness in which motion-specialised cortex (V5) remains intact and is activated through direct connections from the LGN and/or pulvinar. Subjects are able to consciously perceive and discriminate visual motion in their otherwise blind visual field when stimulated with fast motion. [5]

जाग्रत् पश्यति यः प्रेतान् रक्षांसि विविधानि च । अन्यद्वाऽप्यद्भुतं किञ्चिन्न स जीवितुमर्हति॥

Jaagruta --- marhati [*Verse* 10] [3]

Visual hallucinations are defined as a perception of external objects when no such objects are present (जाग्रत् पश्यति यः प्रेतान् रक्षांसि विविधानि). Hallucinations are different from illusions, in which real objects are misinterpreted. Visual hallucinations can occur in various medical, neurological, ocular, and psychiatric disorders. They may relate to anomalies in almost any part of the visual pathway and they are classified in to simple and complex. The simple type includes photopsia (flashes of light), lines or patterns (like fortification spectra, zigzags, or circles). They may be multicoloured and they can be seen in vitreous detachment, optic neuritis, migraine, occipital lobe seizures, occipital lobe tumours, or other structural lesions. Complex visual hallucinations are usually well formed and relatively stereotyped and often involve animals and figures in bright colours and dramatic settings (अन्यद्वाऽप्यद्भुतम्). They can be seen in delirium tremens, dementias, Parkinson's disease, complex partial seizures, misuse of recreational drugs, schizophrenia, peduncular, hypnogogic, and hypnopompic hallucinations, migraine coma, 'Alice in Wonderland syndrome' (AIWS), and 'Charles Bonnet syndrome' (CBS). [15]

योऽग्निं प्रकृतिवर्णस्थं नीलं पश्यति निष्प्रभम्। कृष्णं वा यदि वा शुक्लं निशां व्रजति सप्तमीम्॥

Yo agnim --- saptameem [*Verse* 11] [3]

A colour vision deficiency (CVD) occurs when one or more cones (L, M and S cones sensitive to detect Red, Green and blue colours) are absent or possess abnormal

function. People with CVD see fewer separate hues in their environment, thereby confusing colours that would normally be easily distinguishable by normal trichromats (people who can see and discriminate all the three primary colours). Monochromats are typically totally colour blind, having an inability to distinguish wavelength differences. Dichromats have one cone photo-pigment missing; so, they only have two functional cones and use only two primary colours. A milder colour deficiency occurs when one or more of the three cones function poorly, whereas a more severe form occurs when one of the three cone types does not function entirely. Total achromatopsia (selective loss of colour vision following lesions of colour-specialised cortex) results where there is a loss of all three cone types. Achromats can only attempt to match any colour to any other colour by adjustment of relative brightness (प्रकृतिवर्णस्थं नीलं पश्यति निष्प्रभम्). [16]

Cerebral dyschromatopsia is an impaired colour perception due to an acquired brain lesion. Subjects with achromatopsia complain that everything appears in shades of gray, sometimes less bright (पश्यति निष्प्रभम्) or tinged a "dirty gray" (पश्यति कृष्णं वा). Achromatopsic subjects often have abnormal discrimination of hues and saturation. Achromatopsia is caused by bilateral lesions of the lingual and fusiform gyri and seen in stroke (bilateral sequential or simultaneous infarctions from posterior cerebral arterial occlusions or a coagulopathy), herpes simplex encephalitis, cerebral metastases, repeated focal seizures, focal dementia, and migraine aura. Dyschromatopsia (reversible) can be caused by temporo-occipital white matter damage. [17] According to the above verse, viewing bright red flame as bluish or whiter or shades of gray is '*arishta'* and the person will die within a week. This indicates a cerebral dyschromatopsia or achromatopsia due to an underlying cerebral lesion.

मरीचीनसतो मेघान्मेघान् वाऽप्यसतोऽम्बरे। विद्युतो वा विना मेघैः पश्यन् मरणमृच्छति॥

Mareechi --- maranamrucchhati [*Verse* 12] [3]

Viewing 'मरीची' (flashes), 'मेघ' (clouds), and 'विद्युत् (lightning)' in their absence denotes visual hallucinations which may be due to various underlying disorders. Visual hallucinations are seen in a wide variety of neurological and psychiatric disorders, such as toxic disturbances, drug withdrawal syndromes, focal central nervous system lesions, migraine headaches, blindness, schizophrenia, and psychotic mood disorders. They range from simple and elemental, in which hallucinations consist of flashes of light or geometrical figures to elaborate visions such as a flock of angels etc. [18]

मृन्मयीमिव यः पात्रीं कृष्णाम्बरसमावृतम्। आदित्यमीक्षते शुध्दं चन्द्रं वा न स जीवति॥

Mrunmayeemiva --- jeevati [*Verse* 13] [3]

The term 'scieropia' comes from the Greek words skieros (shady) and opsis (seeing). It translates as 'shady sight' or 'shady eye'. The term is used to denote a visual symptom in which perceived objects and stimuli lack their usual brightness (आदित्यमीक्षते शुध्दं चन्द्रं वा कृष्णाम्बरसमावृतम्) and thus appear to be in a shadow (कृष्णाम्बरसमावृतम्). Contrary to scierneuropsia, scieropia is not conceptualized as necessarily psychogenic in nature. Phenomenologically, scieropia shows certain similarities to scierneuropsia, hemeralopia, and achromatopsia. Scierneuropsia denote a psychogenic visual symptom in which perceived objects and stimuli lack their usual brightness, and thus appear to be in a shadow. "Patients described their visual disturbance in terms of light perception. They stated that objects now appeared dim, that brightness was no longer present. "Patients with scierneuropsia felt that more light was needed to see the objects, which appeared as if seen through a screen or a veil or as if in a shadow". [19] Scieropia refers to darkening of vision and follows diffuse occipital damage (a patient whose vision was dimmed as if seeing everything at twilight). The same symptom occurring without other visual impairments (scierneuropsia) was described in the psychoanalytic literature and is likely to be an example of derealisation. [5]

अपर्वणि यदा पश्येत् सूर्यचन्द्रमसोर्ग्रहम्। अव्याधितो व्याधितो वा तदन्तं तस्य जीवितम्॥

Aparvani --- Jeevitam [*Verse* 14] [3]

If a healthy or diseased person able to see solar eclipse or lunar eclipse in their absence indicates impending death. The above verse denotes either visual hallucinations [20] or VPDs. In scieropia (due to diffuse occipital damage), the persons vision becomes dim and everything is perceived as twilight. [5] In achromatopsia, scierneuropsia, hemeralopia etc conditions objects are perceived as lacking brightness or shadow like or dim or dull or covered. [19]

नक्तं सूर्यमहश्चन्द्रमनग्नौ धूममुत्थितम्। अग्निं वा निष्प्रभं रात्रौ दृष्ट्वा मरणमृच्छति॥

Naktam --- maranamrucchhati [*Verse* 15] [3]

If one sees the sun during the nights and moon during daytime, smoke in the absence of fire and seeing fire as lustreless are considered as *Aristha* (indicates impending death). These should be considered as visual hallucinations. [20] Visual loss is associated with the occurrence of visual hallucinations, which are commonly simple or, more rarely, complex. Visual hallucinations are seen in various conditions like Creutzfeldt-Jakob disease (CJD) (which is a fatal, progressive, neurodegenerative illness caused by central nervous system prion infection), Delirium (a syndrome characterized by disturbance of consciousness caused by a myriad of medical conditions, metabolic disturbances, infections, drug

effects, and intracranial processes), Charles Bonnet Syndrome (CBS), Peduncular Hallucinosis, Parkinsonisms, dementias, epilepsy, migraine, psychiatric disorders and genetic disorders etc. [21] Achromatopsic subjects often have abnormal discrimination of hues and saturation. Achromatopsia is caused by bilateral lesions of the lingual and fusiform gyri and seen in stroke, herpes simplex encephalitis, cerebral metastases, repeated focal seizures, focal dementia, and migraine aura. Subjects with achromatopsia complain that everything appears in shades of gray, sometimes less bright (अग्निं वा निष्प्रभं दृष्ट्वा). [17]

प्रभावतः प्रभाहीनान्निष्प्रभांश्च प्रभावतः। नरा विलिङ्गान् पश्यन्ति भावान् भावाञ्जिहासवः॥

व्याकृतीनि विवर्णानि विसंख्योपगतानि च। विनिमित्तानि पश्यन्ति रूपाण्यायुःक्षये नराः॥

यश्च पश्यत्यदृश्यान् वै दृश्यान् यश्च न पश्यति। तावुभौ पश्यतः क्षिप्रं यमक्षयमसंशयम्॥

Prabhaavataha --- asamshayam [*Verse* 16-18] [3]

विलिङ्गानिति विगतसहजलिङ्गान्। व्याकृतीनीति विविधाकृतीनि॥

विवर्णानीति विरुध्दवर्णानि। विसंख्योपगतानीति विपरीतसंख्यायुक्तानि॥

विनिमित्तानीति विगतनिमित्तानि।रूपाणीति रूपवन्ति द्रव्याणि॥

Vilingaaniti --- dravyaani [*Chakrapani*, *Verse* 16-18] [3]

The above verse denotes various VPDs / visual illusions / hallucinations as depicted below;

प्रभावतः प्रभाहीनम् - Scieropia / Scierneuropsia / Colour agnosia

निष्प्रभांश्च प्रभावतः - Photopsia / Hyperchromatopsia

विलिङ्गानिति विगतसहजलिङ्गान् - Metamorphopsia / various VPDs

व्याकृतीनीति विविधाकृतीनि - Metamorphopsia / Micropsia / Macropsia / Pelopsia / Teleopsia / Simultanagnosia / visual illusions / Dysmetropsia / Prosometamorphopsia

विवर्णानीति विरुध्दवर्णानि - Achromatopsia / Dyschromatopsia / Colour agnosia

विसंख्योपगतानीति विपरीतसंख्यायुक्तानि - Diplopia / Polyopia / Entomopia

पश्यत्यदृश्यान् - Visual hallucinations / Visual anosognosia

दृश्यान् यश्च न पश्यति - Apperceptive agnosia / Agnosopsia / Visual agnosia

विनिमित्तानीति विगतनिमित्तानि - Various latent or subclinical degenerative or vascular or neoplasm or infections or autoimmune pathologies of nervous system and visual pathways.

***Arishta lakshana's* related to other *indriyas'* (sensory organs) (Table 2):**

अशब्दस्य च यः श्रोता शब्दान् यश्च न बुध्यते। द्वावाप्येतौ यथा प्रेतौ तथा ज्ञेयौ विजानता॥

Ashabdasya --- vijaanataa [*Verse* 16-19] [3]

Hearing sounds or voices in their absence and unable to perceived them when they are present is considered as *arishta lakshana*. 'शब्दान् यश्च न बुध्यते' denotes 'Auditory agnosia'. The auditory association area (area 22), which is located inferior and posterior to the primary auditory area in the temporal cortex, allows us to recognize a particular sound as speech, music, or noise. Wernicke's (posterior language) area (area 22 and possibly areas 39 & 40), a broad region in the left temporal and parietal lobes, interprets the meaning of speech by recognizing spoken words. This area is active while we translate words into thoughts. [4] Auditory agnosia is characterized by defective recognition of auditory stimuli in the context of preserved hearing. It is seen in unilateral or bilateral left sided lesions of the superior temporal region, vascular pathology at temporal lobes, post encephalitis and head injury, slow progressive atrophy, and temporal lobe abnormalities. [22]

'अशब्दस्य च यः श्रोता' denotes 'Auditory hallucinations'; Auditory verbal hallucinations (AVH) are subjective perceptions of external speech in the absence of external stimuli. They are strongly associated with schizophrenia and other mental illnesses such as borderline personality disorder, depression, bipolar affective disorders, post-traumatic stress disorder, substance misuse and neuropsychiatric disorders such as dementia, Parkinson's disease and epilepsy. AVH are quite heterogeneous in nature; varying from first to second to third person commentary; from brief utterances of simple sounds or single words to full conversations; consisting of voices from familiar, personal and repeated to the unknown; from passive discussions to issuing commands; and from pleasant or complimentary (unpleasant and distressing most of the times). [23]

संवृत्याङ्गुलिभिः कर्णौ ज्वालाशब्दं य आतुरः। न शृणोति गतासुं तं बुध्दिमान् परिवर्जयेत्॥

Samvrutya --- parivarjayet [*Verse* 20] [3]

If a person is unable to hear the sounds (like fire or burning) when both ears are closed with fingers, then it should be considered as *arishta lakshana*. There are different names to those sounds which can be heard normally when both the ears are closed, 'Phyiological tinnitus', 'Jitter noises produced by the movements of tensor tympani muscles', 'Spontaneous autoacoustic emissions' (SOAE), 'Sounds of spirit', 'Phantom noises (caused by auditory nerves or brain interpreting nerve signals around), and '*Nada* (a form of meditation focussing on inner sounds)' etc. Inability to hear these sounds spontaneously indicates circulatory or neurological or otological pathology. Studies have shown that SOAEs disappear after the inner ear has been damaged.

विपर्ययेण यो विद्याद्गन्धानां साध्वसाधुताम्। न वा तान् सर्वशो विद्यात्तं विद्याद्विगतायुषम्॥

Viparyayena --- aayusham [*Verse* 21] [3]

Perception of pleasant and unpleasant smells in contrary; complete inability to perceive the smell both are considered as *aristha lakshana's*. The above verse indicates various olfactory distortions like `Dysosmia' (any distortion of the sense of smell), `Troposmia' or `parosmia' (distortion when there is an odorant stimulus present), `Phantosmia' (lasting longer than a few seconds), 'Cacosmia' (perception of a bad smell without an odorant stimulus), and `olfactory hallucination' (perception of an odor, usually unpleasant when there is no odorant stimulus present). 'विपर्ययेण यो विद्याद्गन्धानाम्' denotes 'Dysosmia' or 'Parosmia' or 'Cacosmia' or 'Phantosmia' whereas 'न वा तान् सर्वशो विद्यात्' denotes 'Anosmia'. [24] Parosmia can be seen in head trauma, post-URI (upper respiratory tract infection), sinonasal diseases, and toxins/drugs. Common risk factors such as head trauma, stroke, epilepsy, diabetes mellitus, depression, neurodegenerative disorder (Parkinson's disease), toxin (gasoline), medications (adrenergic and cholinergic agents), nasal obstruction, and upper respiratory tract infection are associated with increased prevalence of olfactory impairment. Olfactory dysfunction can be classified into conductive (physical blockage of airflow to olfactory mucosa) or sensory-neural types (disruption of the olfactory-neural signaling pathway). Sensory-neural types include URI, traumatic head injury, neurodegenerative disorders, congenital (Kallman's syndrome), and toxins. The prognosis of sensory-neural types remains poor and is sometimes irreversible. [25]

यो रसान्न विजानाति न वा जानाति तत्वतः। मुखपाकादृते पक्वं तमाहुः कुशला नरम्॥

Yo rasaanna --- naram [*Verse* 22] [3]

Altered perception of the taste or total inability to perceive the taste in absence of oral inflammation should be considered as *Aristha lakshana*. Ageusia is an absence of the sense of taste (रसान्न विजानाति); hypogeusia is a decreased sensitivity to all tastants. Hyperguesia refers to enhanced gustatory sensitivity. Dysgeusia or pargeusia is an unpleasant perception of a tastant (न वा जानाति तत्वतः) and phantogeusia, is a perception of taste that occurs in the absence of a tastant. Gastroesophageal reflux disease can produce apparent phantogeusia. Systemic conditions such as diabetes mellitus, pernicious anemia, Sjogren syndrome, Crohn's disease, cystic fibrosis, Riley-day syndrome, scleroderma, malignancies, deficiency of vitamin A and B_{12}, radiation therapy, zinc deficiency and aging or factors associated with aging may cause gustatory dysfunction. Gustatory dysfunction is also found in post influenza taste disorder, peripheral nerve disorders, CNS (central nervous system) disorders (thalamic & parietal lobe lesions), endocrinal disorder (myxoedema, adrenal insufficiency etc) and in idiopathic conditions. [26]

उष्णाञ्छीतान् खरान् श्लक्ष्णान्मृदूनपि च दारुणान्। स्पृश्यान् स्पृष्ट्वा ततोऽन्यत्वं मुमूर्षस्तेषु मन्यते॥

Ushnaan --- manyate [*Verse* 23] [3]

Altered sensation of touch (such as perceiving cold objects as hot, soft as hard and rough or coarse as smooth) without any visible cause should be considered as *aristha lakshana*. It is known that roughness-smoothness, hardness-softness, stickiness-slipperiness and warm-cold are predominant perceptual dimensions in macro-, micro- and nano-texture perception. The reduction in tactile acuity is matched by a reduction in the biomechanical properties of the skin like moisture, elasticity and finger friction coefficient. [27] Negative symptoms denote damage to the somatosensory system, including deficits such as tactile hypoesthesia, thermal hypoesthesia, pinprick hypoalgesia, anaesthesia or hypesthesia (loss of sensitivity) and loss of vibratory sensation. These symptoms arise due to direct insults to primary sensory neurons which may cause cell death or compromise transduction or conduction or transmission of sensory information. Spontaneous positive sensations evoked by stimulus include hyperalgesia and allodynia (perception of innocuous stimuli as being painful), paresthesia (distorted sensations) and dysesthesia (perception of unpleasant sensations often burning), paroxysmal pain. Ascending fibre stake signals to brainstem, midbrain, central gray, and thalamus. Projections are then made with the frontal and limbic cortex. Descending fibers originating from cortex, hypothalamus, and brainstem project to the spinal cord to facilitate pain transmission. [28] Discriminative tactile sensibilities such as texture recognition are carried in the dorsal columns. Lack of tactile discrimination can be seen in various conditions like generalized polyneuropathy, peripheral neuropathy, radiculopathies, spinal cord injury or diseases (myelopathy), cerebral vascular diseases, tumours of CNS, demyelinating diseases (multiple sclerosis), neurodegenerative diseases (Parkinson's disease), transient ischemic attacks, infections of CNS, deficiencies of vitamin B_{12}, diabetes, migraine, seizures, metabolic and endocrinal diseases etc.

अन्तरेण तपस्तीव्रं योगं वा विधिपूर्वकम्। इन्द्रियैरधिकं पश्यन् पञ्चत्वमधिगच्छति॥

Antarena --- adhigacchhati [*Verse* 24] [3]

Extra sensory perception (ESP) or perceiving things beyond the capacity of sensory organs (in the absence of special powers achieved by rigorous penance or *Yogic* practices) should be considered as *arishta lakshana*. The existence of paranormal phenomena especially 'Extra sensory perception' (ESP) has been disputed for more than a century. The essence of ESP is that, 1. False internal stimulations are mistaken as

external objective stimulations that enter through various senses and similarly, 2. External objective stimulations appear as perceptions that do not actually result from the senses (when one is in deep hallucinations). Four essential phenomena (hallucinations, paranormal phenomena, enhanced awareness and mystical experiences) in ASC (altered states of consciousness) have been hypothesised. When false internal stimulations and external objective stimulations affect perception together, the changes in their relative strengths will result in the consistence, breakdown and re-consistence of the five senses, leading to three states of hallucinations (Elementary-one can distinguish reality from fantasy, Deranged-one cannot distinguish reality from fantasy, and Complete-reality and fantasy are totally reversed). This theory also explains the generation mechanism of out-of-body experiences, synesthesia and many other marvellous psychedelic phenomena of ASC. The loss of the self-results in three mechanisms (enhanced awareness, hallucinations and *jnana samadhi*), which can provide the base for better understanding of ASC. [29]

The above verse denotes hallucinations due to an underlying latent or subclinical pathology of CNS (organic psychosis?). Hallucinations are commonly seen in schizophrenia (organic psychosis in the present context), affective disorders, postpartum psychosis, substance abuse, Delirium tremens, Alcoholic hallucinosis, Borderline personality disorder (BPD), Post traumatic stress disorder (PTSD), Alzheimer's disease (AD), Parkinson's disease (PD), sleep disorders, Systemic lupus erythematosis (SLE) and Lewy body dementia etc. Visual hallucinations are seen in occipital, temporo-parietal lobe lesions whereas olfactory and gustatory hallucinations are seen in lesions of temporal lobe and uncinate gyrus. [30]

इन्द्रियाणामृते दृष्टेरिन्द्रियार्थानदोषजान्। नरः पश्यति यः कश्चिदिन्द्रियैर्न स जीवति॥
Indriayaanaam --- jeevati [*Verse* 25] [3]
Ability to perceive things normally even though sensory organs are incapable to do so are considered as *arishta* (indicates imminent death). The above verse denotes various conditions like hallucinations, complementary multisensory perceptual attributes or synchronous redundant or inter sensory synchrony, and phantom perception etc. A substantial amount of research has been devoted to understanding how the brain handles lags between the senses. Inter sensory timing is flexible and adaptive. The flexibility is clearly demonstrated by studies showing one or another variant of temporal ventriloquism. Small lags go unnoticed because the brain actively shifts one information stream (usually vision) toward the other (इन्द्रियाणामृते दृष्टेरिन्द्रियार्थानदोषजान्), possibly to maintain temporal coherence. The extent to which temporal recalibration generalizes to other stimuli and domains, however, remains to be further explored. Brain compensates for predictable variability between the senses. [31]

Hallucinations, mental imagery, synesthesia, perceptual filling-in, and many illusions are conscious visual experiences without a corresponding retinal stimulus, which is called as 'phantom perception'. Such percept has shown that our experience of the world is not solely determined by direct sensory input. Some phantom percept is voluntary, whereas others are involuntarily, occurring automatically. [32] 'इन्द्रियाणामृते दृष्टेरिन्द्रियार्थानदोषजान् नरः पश्यति यः' (perceiving without the contribution of *indriya's*) denotes 'Phantom perception' (for example, phantom vision in 'Charles Bonnet syndrome') or 'Mental imagery' or 'Synesthesia' or 'Illusions' or 'Hallucinations' or 'Associative learning' or 'Neuropalsticity' (functional recruitment of brain areas normally associated with the sense that is lost by those sensory modalities that are spared) (for example, 'seeing with the brain') etc conditions due to various underlying pathologies.

स्वस्थाः प्रज्ञाविपर्यासैरिन्द्रियार्थेषु वैकृतम्। पश्यन्ति येऽसद्बहुशस्तेषां मरणमादिशेत्॥
Swasthaa --- aadishet [*Verse* 26] [3]
If a healthy person repeatedly perceives abnormal sensations in the absence of object (even though he is intellectually poor or compromised) is considered as *arishta*. This condition denotes 'Neurocognitive disorders' (major or minor). Complex attention, learning and memory, executive ability, language, visuo-constructional perceptual ability, and social cognition are the domains which are going to be affected in various neurocognitive disorders. Dementia, Delirium, Alzheimer's disease, cerebrovascular disease, frontotemporal lobar degeneration, Lewy Body disease, Huntington's disease, traumatic brain injury (TBI), HIV disease, Prion disease and substance use associated disease etc comes under neurocognitive disorders. Many other mental disorders such as schizophrenia, depression, bipolar disorder, and autism, also have shown cognitive manifestations.[33] 'प्रज्ञाविपर्यय' denotes cognitive distortions seen in various 'Neurocognitive disorders'.

CONCLUSION:

Various *arishta lakshana's* explained in this chapter denotes distortions of perception, cognition, illusions, and hallucinations due to an underlying latent or subclinical pathology at the level of CNS (central nervous system) and/or PNS (peripheral nervous system). Manifestation of *Arishta lakshana's* explained in this chapter is due to '*Indriya buddhi vibhrama*' (different types of Agnosias) and pathology at the level of '*Indriyavaha* or *manovaha* or *buddhi vaha srotas*' or at the seat of '*Indriya buddhi'*. Conditions like 'Visual perceptual distortions' (VPDs), 'Neurocognitive disorders' (NCDs), concepts of 'Neuroplasticity', 'Synesthesia', and 'Phantom

perception', 'Organic psychosis', and 'Extra sensory perception' (ESP) etc are mentioned in this chapter. Various prospective or retrospective cohort studies are required to examine the association between *arishta lakshana's* explained in this chapter with death.

Table 1: *Arishta lakshanas* related to vision

Arishta lakshana	Relevant pathology
विगीतमिति विपरीतत्वेन ज्ञातम् *Vigeetamiti --- gnaatam* (Ch. I. 4 / 7; *Chakrapani*)	Visual perceptual distortions (VPDs)
दर्शनमायाति मारुतो *Darshana --- maaruto* (Ch. I. 4 / 8)	Visual hallucinations
अग्निर्नायाति चादीप्तम् *Agni --- adeeptam* (Ch. I. 4 / 8)	Achromatopsia / Dyschromatopsia / Scieropia
जालमजालावतते नरः *Jaalm --- naraha* (Ch. I. 4 / 9)	Myodesopsia
स्थिते गच्छति वा *Sthite gacchhati vaa* (Ch. I. 4 / 9)	Statokinetic dissociation (SKD) / Riddoch phenomenon
जाग्रत् पश्यति यः प्रेतान् *Jaagruta --- pretaan* (Ch. I. 4 / 10)	Visual hallucinations
अन्यद्वाऽप्यद्भुतम् *Anyad vaa api adbhutam* Ch. I. 4 / 10)	Complex visual hallucinations / Photopsia
योऽग्निं प्रकृतिवर्णस्थं नीलं पश्यति *Yo agnim --- pashyati* (Ch. I. 4 / 11)	Monochromats / Dichromats / Achromatopsia
योऽग्निं प्रकृतिवर्णस्थं पश्यति निष्प्रभम् *Yo agnim --- nishprabham* (Ch. I. 4 / 11)	Cerebral dyschromatopsia / Achromatopsia
पश्यति मरीचीनसतो मेघान् विद्युतो वा *Pashyati --- vidyuto vaa* (Ch. I. 4 / 12)	Visual hallucinations
आदित्यमीक्षते कृष्णाम्बरसमावृतम् *Aaditya --- samaavrutam* (Ch. I. 4 / 13)	Scieropia / Scierneuropsia
अपर्वणि यदा पश्येत् सूर्यचन्द्रानि *Aparvani --- chandraani* (Ch. I. 4 / 14)	Achromatopsia / Scierneuropsia / Hemeralopia
अनग्नौ धूममुत्थितम् पश्यति *Anagnau --- pashyati* (Ch. I. 4 / 15)	Simple or complex visual hallucinations
अग्निं वा निष्प्रभं दृष्ट्वा *Agnim --- drushthvaa* (Ch. I. 4 / 15)	Achromatopsia
प्रभावतः प्रभाहीनम् *Prabhaavataha --- heenam* (Ch. I. 4 / 16-18)	Colour agnosia / Scieropia / Scierneuropsia
निष्प्रभांश्च प्रभावतः *Nishprabhaa --- prabhaavataha* (Ch. I. 4 / 16-18)	Photopsia / Hyperchromatopsia
विलिङ्गानिति विगतसहजलिङ्गान् *Vilingaaneeti --- lingaan* (Ch. I. 4 / 16-18)	Metamorphopsia / VPDs
व्याकृतीनीति विविधाकृतीनि *Vyaakruteeni --- aakruteeni* (Ch. I. 4 / 16-18)	Micropsia / Macropsia / Pelopsia / Teleopsia / Dysmetropsia / Prosometamorphopsia / Visual illusions
विवर्णानीति विरुध्दवर्णानि *Vivarnaani --- varnaani* (Ch. I. 4 / 16-18)	Colour agnosia / Dyschromatopsia / Achromatopsia
विसंख्योपगतानीति विपरीतसंख्यायुक्तानि *Visankhyo --- yuktaani* (Ch. I. 4 / 16-18)	Diplopia / Polyopia / Entomopia
पश्यत्यदृश्यान् *Pashyati adrushyaan* (Ch. I. 4 / 16-18)	Visual anosognosia / Visual hallucinations
दृश्यान् यश्च न पश्यति *Drushyaan --- na pashyati* (Ch. I. 4 / 16-18)	Apperceptive agnosia / Agnosopsia / Visual agnosia

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

Table 2: *Arishta lakshanas* related to other sensory organs

Arishta lakshana	Relevant pathology
अशब्दस्य च यः श्रोता *Ashabdasya --- shrotaa* (Ch. I. 4 / 19)	Auditory hallucinations
शब्दान् यश्च न बुध्यते *Shabdaan --- buddhyate* (Ch. I. 4 / 19)	Auditory agnosia
संवृत्याङ्गुलिभिः कर्णौ ज्वालाशब्दं न शृणोति *Samvrutya --- shrunoti* (Ch. I. 4 / 20)	Physiological tinnitus / Phantom noises / Spontaneous autoacoustic emissions (SOAE)
विपर्ययेण यो विद्याद्गन्धान् *Viparyayena --- gandhaan* (Ch. I. 4 / 21)	Dysosmia / Parosmia / Cacosmia
न वा तान् सर्वशो विद्यात् *Na vaa --- vidyaate* (Ch. I. 4 / 21)	Anosmia
रसान्न विजानाति *Rasaan na vijaanaati* (Ch. I. 4 / 22)	Ageusia / Hypogeusia
न वा जानाति तत्वतः *Na vaa jaanaati tatvataha* (Ch. I. 4 / 22)	Dysgeusia / Pargeusia / Phantogeusia
स्पृश्यान् स्पृष्ट्वा ततोऽन्यत्वम् *Sprushyaan --- anyatvam* (Ch. I. 4 / 23)	Dysesthesia / Paresthesia / Allodynia / Lack of tactile discrimination ability
इन्द्रियैरधिकं पश्यन् *Indriyai --- pashyan* (Ch. I. 4 / 24)	Extra sensory perception (ESP), Altered states of consciousness (ASC), Hallucinations
इन्द्रियाणामृते दृष्टेरिन्द्रियार्थानदोषजान् *Indriyaanam --- doshajan* (Ch. I. 4 / 25)	Mental imagery / Phantom perception / Hallucinations / Neuroplasticity / Synesthesia
प्रज्ञाविपर्यय *Pragnaa viparyaya* (Ch. I. 4 / 26)	Cognitive distortions

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

REFERENCES:

1. Dadu V. Charaka - The Ayurveda encyclopedia. Eur J Pharm Med Res. 2016; 3 (7): 175-178. Available from: https://www.ejpmr.com/admin/assets/downloads/1467275632.pdf
2. Agrawal M, Byadgi PS, Dwibedy BK. Importance of Ayu Pareeksha for the Management of Diseases. J Clin Diagn Res. 2017; 11 (1): OE01-OE04. doi: 10.7860/JCDR/2017/20881.9144. PMID: 28273996; PMCID: PMC5324441.
3. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 4th chapter: Indriyaaneekam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 359-361.
4. Gupta K, Mamidi P. Pancha Indriya Buddhi: Association cortices. Int J Yoga - Philosop Psychol Parapsychol 2018; 6: 61-65. doi: 10.4103/ijny.ijoyppp_10_17
5. Ffytche DH, Blom JD, Catani M. Disorders of visual perception. J Neurol Neurosurg Psychiatry 2010; 81:1280-1287. doi:10.1136/jnnp.2008.171348
6. Brooks A, van der Zwan R, Mercier M, Blanke O. Visual neuropsychology. Encyclopedia of Neuroscience. 2009: 4318-4322. Available from: https://www.epfl.ch/labs/lnco/wp-content/uploads/2018/08/2008_Brooks_Einpress_visual-neuropsychology.pdf
7. Midena E, Vujosevic S. Metamorphopsia: an overlooked visual symptom. Ophthalmic Res 2016; 55: 26–36. doi: 10.1159/000441033
8. Craje C, Santello M, Gordon AM (2013) Effects of Visual Cues of Object Density on Perception and Anticipatory Control of Dexterous Manipulation. PLoS ONE 8 (10): e76855. doi:10.1371/journal.pone.0076855
9. Ffytche DH, Howard RJ. The perceptual consequences of visual loss: 'Positive' pathologies of vision. Brain 1999; 122: 1247-1260. doi: 10.1093/brain/122.7.1247
10. Teeple RC, Caplan JP, Stern TA. Visual hallucinations: differential diagnosis and treatment. Prim Care Companion J Clin Psychiatry. 2009; 11 (1): 26-32. doi: 10.4088/pcc.08r00673
11. Nijober TCW (Thesis). Neuropsychology of colour vision. 2007; ISBN/EAN: 9789039345580 Available from: file:///C:/Users/prasad%20mamidi.prasadmamidi-PC/Downloads/full%20(1).pdf
12. Tseng GL, Chen CY. Doctor-shopping behavior among patients with eye floaters. Int J Environ Res Public Health 2015; 12 (7): 7949-7958. doi: https://doi.org/10.3390/ijerph120707949
13. Ishii K, Nakaya A, Fujita S, Satake A, Azuma Y, Tsubokura Y, Saito R, Konishi A, Hotta M, Yoshimura H, Ito T. Myodesopsia is a symptom of central nervous system blast crisis in chronic myeloid leukemia. Leukemia research reports. 2019; 11: 8-10. doi: https://doi.org/10.1016/j.lrr.2019.03.001
14. Hayashi R, Yamaguchi S, Narimatsu T, Miyata H, Katsumata Y, Mimura M. Statokinetic Dissociation (Riddoch Phenomenon) in a Patient with Homonymous Hemianopsia as the First Sign of Posterior Cortical Atrophy. Case Rep Neurol. 2017; 9 (3): 256-260. doi: 10.1159/000481304. PMID: 29422846; PMCID: PMC5803707.
15. Jacob A, Prasad S, Boggild M, Chandratre S. Charles Bonnet syndrome--elderly people and visual hallucinations. BMJ 2004; 328 (7455): 1552-1554. doi: 10.1136/bmj.328.7455.1552. PMID: 15217875; PMCID: PMC437154.
16. Hasrod N, Rubin A. Defects of colour vision: A review of congenital and acquired colour vision deficiencies. Afr Vision Eye Health 2016; 75 (1): a365. doi: http://dx.doi.org/10.4102/aveh.v75i1.365
17. Barton JJS (2011). Neuro-ophthalmology in Handbook of Clinical Neurology edited by Kennard C & Leigh RJ (3rd series). Vol.102; pp. 223-261. doi: https://doi.org/10.1016/B978-0-444-52903-9.00015-7

18. Chakrabarty A, Reddy MS. Visual hallucinations in mania. Indian J Psychol Med. 2011; 33 (1): 71-73. doi: 10.4103/0253-7176.85399. PMID: 22021957; PMCID: PMC3195159.
19. Blom JD (2010). A Dictionary of Hallucinations. New York: Springer Science+Business Media. pp. 462-463. ISBN: 978-1- 4419-1222-0. doi: 10.1007/978-1-4419-1223-7.
20. Balsavar A, Deshpande SN. Hallucinations in the classical Indian system of Ayurveda: A brief overview. Indian J Psychiatry 2014; 56: 325-329. doi: 10.4103/0019-5545.146510
21. Onofrj M, Thomas A, Martinotti G, et al. The clinical associations of visual hallucinations, In: Collerton D, Mosiman, UP, Perry E. The neuroscience of visual hallucinations. Oxford: Wiley Blackwell; 2015: 91–112. doi: https://doi.org/10.1002/9781118892794.ch5
22. Simons JS, Ralph MAL. The auditory agnosias. Neurocase 1999; 5: 379-406. Available from: http://www.memlab.psychol.cam.ac.uk/pubs/Simons1999%20Neurocase.pdf
23. Tracy DK, Shergill SS. Mechanisms underlying auditory hallucinations - Understanding perception without stimulus. Brain Sci. 2013; 3: 642-649. doi: 10.3390/brainscii3020642
24. Leopold D. Distortion of Olfactory Perception: Diagnosis and Treatment. Chem. Senses 2002; 27 (7): 611–615. https://doi.org/10.1093/chemse/27.7.611
25. Cho SH. Clinical diagnosis and treatment of olfactory dysfunction. Hanyang Med Rev 2014; 34: 107–115. http://dx.doi.org/10.7599/hmr.2014.34.3.107
26. Maheswaran T, Abikshyeet P, Sitra G, Gokulanathan S, Vaithiyanadane V, Jeelani S. Gustatory dysfunction. J Pharm Bioallied Sci. 2014; 6 (Suppl-1): S30-33. doi: 10.4103/0975-7406.137257. PMID: 25210380; PMCID: PMC4157276.
27. Skedung L, El Rawadi C, Arvidsson, M. et al. Mechanisms of tactile sensory deterioration amongst the elderly. Sci Rep 2018; 5303.https://doi.org/10.1038/s41598-018-23688-6
28. Ahlawat A. Comprehensive review on molecular mechanisms of neuropathic pain. J Innov Pharm. 2017; 4 (3): 87-96. Available from: http://www.jipbs.com/VolumeArticles/FullTextPDF/316_JIPBSV4I314.pdf
29. Huang W. New Insights into ESP, Hallucinations and ASC. Journal of Consciousness Exploration & Research. 2018; 9 (4): 307-316. Available from: https://www.academia.edu/38222900/New_Insights_into_ESP_Hallucinations_and_ASC
30. Chaudhury S. Hallucinations: Clinical aspects and management. Ind Psychiatry J. 2010; 19 (1): 5-12. doi: 10.4103/0972-6748.77625. PMID: 21694785; PMCID: PMC3105559.
31. Keetels M, Vroomen J (2012). Perception of Synchrony between the Senses (Chapter-9). In: Murray MM, Wallace MT, editors. The Neural Bases of Multisensory Processes. Boca Raton (FL): CRC Press/Taylor & Francis. Available from: https://www.ncbi.nlm.nih.gov/books/NBK92837/
32. Pearson J, Westbrook F. Phantom perception: Voluntary and involuntary non retinal vision. Trends Cogn Sci. 2015; 19 (5): doi: https://doi.org/10.1016/j.tics.2015.03.004
33. Ganguli M, Blacker D, Blazer DG, Grant I, Jeste DV, Paulsen JS, Petersen RC, Sachdev PS. Classification of neurocognitive disorders in DSM-5: a work in progress. Am J Geriatr Psychiatry. 2011; 19 (3): 205–210. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3076370/pdf/nihms-273128.pdf

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PURVARUPEEYAM OF CHARAKA INDRIYA STHANA – AN EXPLORATIVE STUDY

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REVIEW ARTICLE

PURVARUPEEYAM OF CHARAKA INDRIYA STHANA– AN EXPLORATIVE STUDY

Abstract:
Charaka samhita is the most authoritative and comprehensive compendium of *Ayurvedic* literature touching almost each and every aspect of health care. Though this treatise being the oldest available literature of *Ayurveda* (estimated to be documented in 200 BC), is truly a versatile classic. *Indriya sthana* deals with various fatal signs and symptoms which denote imminent death and prognostication of life expectancy in the patients who are at end-of-life stages. *Indriya sthana* of *Charaka samhita* consists 12 chapters and '*Purvarupeeyam indriyam*' is the 5th chapter of *Indriya sthana*. '*Purvarupeeyam indriyam*' chapter contains various *arishta lakshanas* (fatal signs and symptoms which indicates imminent death) pertaining to prodromal features of various diseases. This chapter deals with *arishta lakshanas* pertaining to premonitory signs and symptoms of various disease conditions which are having prognostic significance. The present chapter also deals with the concepts like physiology and classification of dreams, auspicious and inauspicious dreams, and *arishta lakshanas* pertaining to dreams. The present study is aimed at reviewing the concepts available in '*Purvarupeeyam indriyam'* chapter and also analyse their role and potential in contemporary clinical prognostication. Prospective controlled studies and longitudinal prospective and retrospective cohort studies are required to establish the facts mentioned in this chapter. Various technological advances like fMRI (functional magnetic resonance imaging), Polysomnography, sleep studies, and EEG (electro encephalography) etc should be incorporated to study different dreams mentioned in this chapter and their role in prognosis. Analysis or interpretation of dreams mentioned in this chapter needs to be explored and standardized. Further research works are required to substantiate the opinions or claims mentioned in this chapter.

Key Words: Analysis of dreams, fMRI, EEG, Interpretation of dreams, Polysomnography, Sleep studies

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INTRODUCTION:

Ayurveda is a traditional system of medicine originated in the ancient *Vedic t*imes of India. It is a comprehensive approach to health and homeostasis that addresses body, mind, emotions, spirit, and environment. [1] *Charaka samhita* is the most authoritative and comprehensive compendium of *Ayurvedic* knowledge covering almost each and every aspect of health care. Though this treatise being the oldest available literature of *Ayurveda* (estimated to be documented in 200 BC), is truly a versatile classic. As per composer of the text, 12,000 verses are documented but only 9295 verses are available in presently available *Charaka samhita*. [2]

Charaka samhita consists eight sections and '*Indriya sthana*' is the fifth section among eight. *Indriya sthana* (the word '*indra'* denotes '*prana'* or life) consists 12 chapters and it deals with the predictors of life, and not just determinants or symptoms of death. *Indriya sthana* was designed to tell the *Ayu* (life span) of the diseased person with the help of *arishta lakshanas*. *Arishta lakshanas* are the fatal signs and symptoms which denote imminent death in a diseased person. [3] '*Purvarupeeyam indriyam*' is the name of the fifth chapter of *Charaka Indriya sthana* and it deals with *arishta lakshanas* pertaining to premonitory signs and symptoms of various diseases. Along with the assessment or predicting prognosis based on the prodromal features of various diseases the present chapter also deals with the concepts like physiology and classification of dreams, auspicious and inauspicious dreams, and *arishta lakshanas* pertaining to dreams. [4] The present study reviews the concepts available in '*Purvarupeeyam indriyam'* chapter and also analyse their role and potential in contemporary clinical prognostication.

MAIN CONTENTS:

पूर्वरूपाण्यसाध्यानां विकाराणां पृथक् पृथक्। भिन्नाभिन्नानि वक्ष्यामो भिषजां ज्ञानवृध्दये ॥

Purvarupaani ---- vruddhaye [*Verse* 3] [4]

अन्यस्यापि च रोगस्य पूर्वरूपाणि यं नरम्। विशन्त्यनेन कल्पेन तस्यापि मरणं ध्रुवम्॥

Anyasyaapi ---- dhruvam [*Verse* 5] [4]

पूर्वरूपैकदेशांस्तु वक्ष्यामोऽन्यान् सुदारुणान्। ये रोगाननुबध्नन्ति मृत्युर्येरनुबध्यते ॥

Purvarupai ---- anubadhyate [*Verse* 6] [4]

The above verses explain the importance of the knowledge of prodromal symptoms of various diseases to predict the prognosis and also the correlation between the intensity of prodromal symptoms with the prognosis of a disease or death. Recent research works also have been supporting the above concept. According to a recent prospective longitudinal neuroimaging study, initial levels of prodromal symptom severity predict a steeper rate of cortical thinning, consistent with the theoretical view that

increasing clinical symptom severity during the prodromal state (अतिमात्रया विशन्त्यनेन कल्पेन) is a consequence of increasing disruption in synaptic activity and functional connectivity in the brain, of which accelerated gray matter loss (तस्यापि मरणं ध्रुवम्) may be an indicator. Previous studies also indicate that higher levels of unusual thought content during prodromal states are a significant predictor of psychosis. [5]

Patients often have warning symptoms in the days to weeks before an AMI (Acute myocardial infarction) or SCD (Sudden cardiac death). It is possible that warning signs correlate with prognosis after AMI or SCD. Warning signs differ from acute symptoms in that they are experienced before the actual event. In addition to (रोगाननुबध्नन्ति) angina and respiratory complaints, they frequently involve generalized fatigue, anxiety, and influenza-like symptoms. However, they can be nonspecific, and there is likely to be significant overlap between those that precede AMI, SCD, or even non cardiac conditions. [5] Another study has depicted that, severity of the prodromal gastrointestinal illness is associated with the course and complications of the extra intestinal manifestations (अन्यान् सुदारुणान्) of hemolytic-uremic syndrome. The severity of the gastrointestinal prodrome reflects the severity of the extra intestinal acute microangiopathic process and the resulting long-term outcome. [7] Severity of prodromal symptoms and their comorbidity with other conditions are positively associated with poor prognosis.

***Purvarupa arishta lakshanas* of some diseases (Table 1):**

पूर्वरूपाणि सर्वाणि ज्वरोक्तान्यतिमात्रया। यं विशन्ति विशत्येनं मृत्युर्ज्वरपुरःसरः॥
Purvarupaani ---- purassara [*Verse* 4] [4]

The febrile response is a significant contributor to the pathogenesis, clinical presentation, and outcome of many illnesses and diseases. The presence and height of prodromal fever (पूर्वरूपाणि ज्वरोक्तान्यतिमात्रया) correlate with the severity and prognosis of certain infectious diseases. [8] More severe prodromal symptoms with high fever, severe headache, and abdominal pain are seen in 'Hemorrhagic small pox' which causes death usually by the 5th or 6th day of the rash, often before characteristic smallpox lesions develop. Death results from a profound toxemia, leading to multi-organ failure. [9] In '*Plasmodium falciparum malaria'*, the onset of fever occurs after few days of prodromal symptoms started. Fever occurs daily and the symptoms present in the prodromal phase continue and increase, configuring a flu-like syndrome. Anorexia, dyspepsia, epigastric discomfort, nausea, vomiting and watery diarrhoea are frequent and 'Herpes labialis' also may be present. A dry cough, an increase in the respiration rate, tender hepatosplenomegaly, orthostatic hypotension, jaundice, rapid pulse (100 to 120 beats/min) and low blood pressure (90–100 mmHg, systolic) can be seen (पूर्वरूपाणि सर्वाणि ज्वरोक्तान्यतिमात्रया). Serious complications may develop at any stage. *Plasmodium falciparum* malaria may progress very rapidly to severe malaria unless appropriate treatment is started. [10]

In children, fever, conjunctivitis, cough, photophobia, restlessness, malaise, tenderness of head, neck, limbs, and a marked change of mood are part of the usual symptoms occurring during prodromal phase of measles (four days prior to the appearance of the measles rash). Some degree of drowsiness, occasional prolonged crying, and slight neck stiffness during this period indicates mild neurological complications. "Shivering fits or, in young children, convulsions may occur during the prodromal stage. In some epidemics of measles, the patient during the prodromal stage remains in a dull somnolent state. Prolonged sleepiness, short periods of confusion, or an isolated convulsion during prodromal phase of measles may be indicative of encephalitis (रोगाननुबध्नन्ति अन्यान् सुदारुणान्). [11] In acute idiopathic pericarditis, prodromal diarrhea, sore throat and fever strongly predict myocardial involvement, resulting in life-threatening hemodynamic compromise in a minority of the patients. [12]

बलं च हीयते यस्य प्रतिश्यायश्च वर्धते। तस्य नारीप्रसक्तस्य शोषोऽन्तायोपजायते॥
Balam cha ---- upajaayate [*Verse* 7] [4]

Wasting (बलं च हीयते) has long been recognized as a prominent feature of tuberculosis and is probably one of the determinants of the disease severity and outcome. Tuberculosis often leads to severe weight loss (wasting) (बलं च हीयते), probably through the production of inflammatory mediators. Wasting, in turn, affects the inflammatory response, suppresses cellular immunity, and aggravates the outcome of tuberculosis. [13] Tuberculous involvement of nose, nasopharynx and para nasal sinuses is extremely rare even in countries with a high incidence of pulmonary disease. Nasal and sinus tuberculosis remain both silent and asymptomatic until well advanced (प्रतिश्यायश्च वर्धते). It develops, almost always, secondarily to a tuberculous focus elsewhere in the respiratory tract. Although nasal mucosa is inherently very resistant to tubercle bacillus, both trauma and atrophic changes facilitate successful lodging of bacilli within the nasal lining. [14]

Acquisition of HIV infection by individuals with pre-existing latent TB is devastating in settings where TB is highly prevalent, because co-infected individuals experience higher rates of complications from both TB and HIV (e.g., TB reactivation, TB disease severity, further immune suppression). [15] Urogenital Tuberculosis (UGTB) is the most common extra-pulmonary manifestation of tuberculosis (TB). Prostate

TB is considered as sexually transmitted disease. Genital TB, both female and male, lead to infertility and decreased a sexual function as whole that reduces a quality of life. Chronic infection, long isolation, intake of big quantity of drugs leads to sexual dysfunction including infertility. [16] The association between TB and sexual behaviour has rarely been studied, except within the context of HIV infection. According to a study, many HIV negative TB patients have reported high-risk sexual behaviour (नारीप्रसक्तस्य). A study on prisoners who reported a history of TB has reported higher sexual risk factors. Excessive sexual intercourse while having TB may increase the chances of getting infected with HIV or other sexually transmitted infections which together may leads to early death. [17]

लाक्षारक्ताम्बराभं यः पश्यत्यम्बरमन्तिकात्। स रक्तपित्तमासाद्य तेनैवान्ताय नीयते॥

Laksha ---- neeyate [*Verse* 10] [4]

Leakage of the blood into the vitreous humor is called a vitreous hemorrhage. There are many causes of bleeding into the vitreous body (diabetic retinopathy, retinal vein occlusion, retinal detachment, damage of retinal vessels, age-related macular degeneration, tumours, and macroaneurysm). The symptoms include haziness of the visual field, blurry vision, shadows, red hues (लाक्षारक्ताम्बराभम्), appearance of spots or floaters in the vision, and, in severe cases, blindness. [18] A patient with a past medical history of peripheral artery disease, hypertension, coronary artery disease, and macular degeneration presented to the emergency department with three days of weakness, nausea, hematemesis and hematochezia (रक्तपित्तमासाद्य). After further investigations, it was discovered that she carried a diagnosis of 'Charles Bonnet Syndrome' (CBS) and had previously suffered from visual hallucinations (लाक्षारक्ताम्बराभम् ?). CBS is often misdiagnosed as psychosis or dementia. CBS is characterized by three clinical features visual release hallucinations, acute or chronic ocular pathology causing visual deterioration and preserved cognitive status. The present case may denote the condition mentioned in the above verse. [19] Patients of overt 'Hepatic Encephalopathy' (HE) due to cirrhosis may present with hematemesis, melena, heamatochezia (रक्तपित्तमासाद्य) and hepatic / Wernicke's encephalopathy (ophthalmoparesia, nystagmus, ataxia, confabulation or short-term memory loss) (लाक्षारक्ताम्बराभम् यः पश्यति). [20] The above verse may denote various pathological conditions like 'Rupture of cerebral aneurysms' or 'Vascular dementia' or 'Hypertensive encephalopathy' or 'Vascular neuro-ophthalmological conditions' etc.

शूलाटोपान्त्रकूजाश्च दौर्बल्यं चातिमात्रया। नखादिषु च वैवर्ण्ये गुल्मानान्तकरो ग्रहः॥

Shoola ---- graha [*Verse* 12] [4]

Abdominal pain, borborygmi, pale nails, and weakness etc denote chronic or recurrent gastrointestinal bleeding seen in duodenal ulcer, gastic ulcer, gastric erosions, oesophagitis, gastric cancer, tears of the lower oesophagus and oesophageal varices. Chronic bleeding from the alimentary tract frequently causes no noticeable change in the faeces and the commonest presentation is anaemia (नखादिषु च वैवर्ण्ये). [21] Intra-abdominal tumours, intestinal obstruction or acute abdomen and abdominal tuberculosis etc conditions also should be considered for the above verse.

कायेऽल्पमपि संस्पृष्टं सुभृशं यस्य दीर्यते। क्षतानि च न रोहन्ति कुष्टैमृत्युर्हिनस्ति तम्॥

Kaaye alpamapi ---- tam [*Verse* 14] [4]

Some wounds close very slowly, keep on opening up, or don't heal at all. People who develop chronic wounds often have an underlying condition that causes even minor pressure (कायेऽल्पमपि संस्पृष्टं सुभृशम्) to lead to wounds that then no longer heal (क्षतानि च न रोहन्ति). Various factors like poor circulation (peripheral artery disease), venous insufficiency, diabetes, weakened immune system (due to cancer or infection or malnutrition), and mechanical pressure etc makes delay in wound healing.[22] The above verse also suggests 'wound malignancy' conditions like 'Basal cell carcinoma' or 'Squamous cell carcinoma' or 'Marjolin's ulcer' etc.

स्नातानुलिप्तगात्रेऽपि यस्मिन् गृध्रन्ति मक्षिकाः। स प्रमेहेण संस्पर्शे प्राप्य तेनैव हन्यते॥

Snaataanulipta ---- hanyate [*Verse* 16] [4]

It has been found that, patients with diabetes might receive more infectious mosquito bites. Olfactory signals mediate mosquito attraction, and these, including expiration, are subtly altered in patients with type 2 diabetes mellitus. [23] When selecting a human host, mosquitoes have a preference for certain individuals. Various factors contribute to differential attractiveness to biting insects. Pregnancy, greater body mass (greater surface area and CO_2 output), those infected with malaria, higher body temperatures with increased relative humidity and some dietary factors makes an individual more attractive to Anopheles gambiae (the principal malaria vector in Africa) and other mosquitoes. [24] A mixture of different odours and compounds like CO_2, shot chain carboxylic acids, ammonia and other sweat compounds contributes to attraction of the insects. [25] The above verse indicates the condition of either diabetic ketoacidosis or hyperglycemia etc which may attract mosquitoes or flies.

ध्यानायासौ तथोद्वेगौ मोहश्चास्थान संभवः। अरतिर्बलहानिश्च मृत्युरुन्मादपूर्वकः॥

Dhyaana ---- purvaka [*Verse* 18] [4]

The above verse denotes 'Delirium'. Disturbance of consciousness (मोह), momentary cognitive changes, perseveration (ध्यान), inability to focus, shift and sustain attention, getting easily distracted by irrelevant stimuli

(मोहश्चास्थान संभवः), disorientation, misinterpretations, illusions (मोह), hallucinations, restlessness, hypoactive features like sluggishness (बलहानिश्च) and lethargy (बलहानिश्च), increased psychomotor activity (आयास), and stupor (मोह) etc are the characteristic features of delirium. The individual with delirium may also exhibit emotional disturbances such as anxiety (उद्वेग), fear, depression, irritability (अरति), anger, euphoria and apathy. The disturbed emotional state may also be evident in calling out, screaming, cursing, muttering, moaning, or other sounds. [26] The above verse may also denote 'Organic psychoses.'

आहारद्वेषिणं पश्यन् लुप्तचित्तमुदर्दितम्। विद्यात् धीरो मुमूर्षुं तमुन्मादेनातिपातिना॥

Aahaara ---- *atipaatina* [*Verse* 19] [4]

Catatonia is characterized by the features like immobility, extreme negativism, mutism (लुप्तचित्तम्), and echolalia etc. Motoric immobility may be manifested by catalepsy (waxy flexibility) and extreme negativism (आहारद्वेषिणम्) may be manifested by an apparently motiveless resistance to all instructions or maintenance of a rigid posture against attempts to be moved. During severe catatonic stupor (लुप्तचित्तम्), careful supervision is required to prevent self-harm or harming others. Malnutrition (due to आहारद्वेषिणम्), exhaustion, hyperpyrexia and self-inflicted injury are the potential risks in catatonia. [27] The negative symptoms of Schizophrenia account for a substantial degree of morbidity associated with the disorder. Affective flattening (लुप्तचित्तम्), alogia (poverty of speech), avolition (inability to initiate and persist in goal directed activities), and anehedonia (losing interest in previously pleasurable activities) etc are considered as negative symptoms of Schizophrenia. [28] 'उदर्दितम्' may denote allergic condition comorbid with the above psychiatric disorders. The above verse may also denote the conditions like 'Major depressive episode' or 'Mood disorders'.

क्रोधनं त्रासबहुलं सकृत्प्रहसिताननम्। मूर्च्छापिपासाबहुलं हन्त्युन्मादः शरीरिणाम्॥

Krodhanam ---- *shareerinaam* [*Verse* 20] [4]

The causes of metabolic encephalopathy (ME) are different. The most frequent ones are hypoxia, ischemia, systemic disease, and toxic agents. Hypoxia occurs in anemia, pulmonary diseases (chronic obstructive pulmonary disease), and alveolar hypoventilation. Ischemia occurs mostly due to cardiovascular diseases including acute congestive heart failure, cardiac arrhythmia, microvascular disease, and hypo or hypertension. ME has often been seen with hepatic and renal insufficiency, pancreatitis, malnutrition, electrolyte imbalances (such as hypo and hyperglycemia, hypo and hypercalcemia, and hypo and hypernatremia), particularly in sepsis, infection, vasculitis, and malignancy (paraneoplastic syndromes). ME can also occur as a result of various toxic agents such as alcohol, sedatives, psychiatric agents, heavy metal poisoning, organic phosphates, and other drugs. Clinical presentation varies from subtle behaviour changes to severe consciousness disturbances such as stupor or coma (मूर्च्छा), or personality disorders (क्रोधनं त्रासबहुलं सकृत्प्रहसिताननम्) with psychomotor hyperactivity, agitation (क्रोधनम्), hallucinations, and illusions. Orientation and mood disorders (सकृत्प्रहसिताननम्), thought and memory disorders, intellectual deterioration, dementia, and depression may also occur. The most common symptom in ME is delirium. [29] 'पिपासाबहुलम्' denotes excessive thirst which may be due to an underlying systemic disease or pathological condition like hyperglycemia or hypovolemia or imbalance of electrolytes or acid-bases. The above verse may also denote conditions like 'Personality change due to a general medical condition' or 'Panic attack or disorder' or 'Organic psychoses' and 'Frontal lobe tumours' etc.

असत्तमः पश्यति यः श्रुणोत्यप्यसतः स्वनान्। बहून् बहुविधान् जाग्रत् सोऽपस्मारेण बध्यते॥

Asattama ---- *badhyate* [*Verse* 21] [4]

Approximately 5% of patients with epilepsy have occipital seizures, which almost always have visual manifestations. Epileptic visual hallucinations often are simple, brief, stereotyped, and fragmentary (असत्तमः पश्यति यः). They usually consist of small, brightly coloured spots or shapes that flash. Complex visual hallucinations in epilepsy are similar to hypnagogic hallucinations (बहून् बहुविधान्). Intracranial EEG (electroencephalography) recordings have shown that pathological excitation of visual cortical areas may be responsible for complex visual hallucinations in epilepsy. Partial seizures may cause auditory hallucinations. Perceptions of music have been associated with partial seizures. Patients with temporal lobe epilepsy have shown auditory hallucinations as a component of their seizures. These hallucinations typically are brief, stereotyped sensory impressions and, if formed, may be trivial sentences, previously heard phrases, or commands (श्रुणोत्यप्यसतः स्वनान्). CNS (central nervous system) neoplasms can also produce auditory hallucinations. Haemorrhages and arterio-venous malformations in the pontine tegmentum and lower midbrain have been associated with acute onset of auditory hallucinations. [30]

स्तभ्येते प्रतिबुध्दस्य हनू मन्ये तथाऽक्षिणी। यस्य तं बहिरायामो गृहीत्वा हन्त्यसंशयम्॥

Stabhyete ---- *asamshayam* [*Verse* 22] [4]

The muscular rigidity and spasms of tetanus are caused by tetanus toxin (tetanospasmin), which is produced by *Clostridium tetani*, an anaerobic bacillus. Tetanus toxin causes hyperactivity of voluntary muscles in the

form of rigidity and spasms. Rigidity of the temporal and masseter muscles leads to trismus (lockjaw) (स्तब्धेते हनू). Generalized and neonatal tetanus affect muscles of the whole body and lead to opisthotonus (the backward arching of the column due to rigidity of the extensor muscles of the neck and back) (बहिरायामो) and may cause respiratory failure and death (हन्त्यसंशयम्) due to rigidity and spasms of the laryngeal and respiratory muscles. Depending on whether it is local/cephalic or generalized/neonatal, tetanus typically manifests as trismus/lockjaw, risus sardonicus, dysphagia, neck stiffness (स्तब्धेते मन्ये), abdominal rigidity, and opisthotonus (hyperactivity of muscles of the head, neck, and trunk). [31]

एतानि पूर्वरूपाणि यः सम्यगवबुध्यते। स एषामनुबन्धं च फलं च ज्ञातुमर्हति॥

Etaani ---- marhati [*Verse* 24] [4]

Proper understanding of the *arishta lakshana's* related to *purvarupa's* (prodromal symptoms) as explained above provides the better knowledge of prognosis to physician.

Dreams (Table 2):

मनोवहानां पूर्णत्वाद्दोषैरतिबलैस्त्रिभिः। स्रोतसां दारुणान् स्वप्नान् काले पश्यति दारुणे॥

Manovahaanaam ---- daarune [*Verse* 41] [4]

Oneirology is the scientific study of dreams. Ancient Indian scholars have used *swapna* (dreams) as a tool to understand the mind, to diagnose a disease, to assess the prognosis of a condition, for personality assessment and also to know life expectancy. The dream has been described from physiological, pathological, diagnostic, prognostic and therapeutic point of view in *Ayurvedic* texts. *Swapna* is defined as an illusionary experience in semi-awakened state. [32] Aristotle believed that during sleep the mind receives stimuli from both the external environment and from within the body (पूर्णत्वाद्दोषैरतिबलैस्त्रिभिः), and that these served as the building blocks on which dreams were constructed. Organic states (पूर्णत्वाद्दोषैरतिबलैस्त्रिभिः) could instigate dreams. Rapid eye movement (REM) sleep is associated with dreaming. "Dream sleep" is associated with wide fluctuations in physiological measurements (including temperature, heart rate, blood pressure, gastric acid secretion, and serum catecholamine concentrations). [33]

Every dream will reveal itself as a psychological structure, full of significance, and one which may be assigned to a specific place in the psychic activities of the waking state. Psychic forces (मनोवहानाम्) are responsible for dreams. The dream is defined as the psychic activity of the sleeper. Dreams are the functioning of mind (मनोवहानाम्). The products of fatigue which have accumulated in the albumen of brain gradually increased and produce dreams (पूर्णत्वाद्दोषैरतिबलैस्त्रिभिः). Dreams occur as reactions to the real-life disturbances (काले पश्यति दारुणे). [34] Dream content reflects waking-life experiences, current concerns, and waking-life symptoms (काले पश्यति दारुणे). [35]

नातिप्रसुप्तः पुरुषः सफलानफलांस्तथा। इन्द्रियेशेन मनसा स्वप्नान् पश्यत्यनेकधा॥

Naati prasupta ---- anekadha [*Verse* 42] [4]

Based on intensity, dreams are classified in to two, '*Saphala'* (productive) and '*Aphala'* (unproductive). '*Aphala'* (less productive) dreams are those which are seen during daytime and they may be too long or short in duration and they are also forgotten easily. Dreams occur only in REM (Rapid eye movement) phase of sleep where the person can be aroused easily (नातिप्रसुप्तः). The effectiveness or productiveness of dreams (सफलानफलांस्तथा) depends on their intensity. [34] A dream converts the slight sensations perceived in sleep into intense sensations (for example, one imagines that one is walking through fire, and feels hot, if his or her part of the body becomes only quite slightly warm in reality) (इन्द्रियेशेन मनसा). External sensory stimuli are the source of dreams. The sensory stimuli that reach us during sleep may easily become the source of dreams (इन्द्रियेशेन मनसा). The main proof of the dream-inciting power of subjective sensory stimuli is afforded by the 'Hypnogogic hallucinations' (which are imagined sensations seems to be very real and occurs when a person is falling asleep). [34]

दृष्टं श्रुतानुभूतं च प्रार्थितं कल्पितं तथा। भाविकं दोषजं चैव स्वप्नं सप्तविधं विदुः॥

Drushtam ---- vidu [*Verse* 43] [4]

Dreams are classified in to seven types, '*Drishta'* (seen), '*Shruta'* (heard), '*Anubhuta'* (experienced), '*Prarthita'* (desired / wished), '*Kalpita'* (imaginary), '*Bhavika'* (feelings), and '*Doshaja'* (due to internal imbalances or organic). External sensory stimuli are the main source for dreams which includes visual (दृष्टम्), auditory (श्रुतम्) and other sensations. Dreams get their material from reality, and from the psychic life centred upon this reality. However extraordinary the dream may seem, it can never detach itself from the real world, and it must always borrow their elementary material either from that which our eyes have beheld in the outer world, or from that which has already found a place somewhere in our waking thoughts; in other words, it must be taken from that which we have already experienced (अनुभूतम्), either objectively or subjectively. A dream is the fulfilment of a wish or a desire or a motive (प्रार्थितम्). [34] The most noted psychological properties of dreams, their bizarreness and their meaningfulness or symbolic value, are neither unique to nor even remarkably distinctive of dreaming. Studies have revealed that relatively few dreams are very bizarre, which suggests that dreams have a reputation for bizarreness because bizarre dreams are most recalled and savoured. Also, artists or even common daydreamers can create images and plots as

wild as the strangest dreams. Meaningfulness is certainly not restricted to dreams (कल्पितम्). [36]

Unconscious motives, or suppressed wishful impulses becomes sources of the dreams which may become real later (for example, punishment dreams, absurd dreams, danger dreams etc) (भाविकम्). Internal organic somatic stimuli derived from our internal organs (when they are excited). [34] It has long been recognised that dreams reflect the presence of illness even if the patient is unaware of it. Dreams about death and dying are prevalent among people with serious organic disease. Prospective studies have shown that among men dreams of death, and among women dreams of separation, correlate with worse clinical outcomes independent of the disease, and with the severity of cardiac dysfunction in patients with cardiac disease. Dreams of "lost resources" have been correlated with the finding of brain atrophy without overt signs of organic brain disease. It has been hypothesised that dreams "warn" medically ill patients whose illness is seen as threatening to both the body and the ego (दोषजम्). [33]

तत्र पञ्चविधं पूर्वमफलं भिषगादिशेत्। दिवास्वप्नमतिह्रस्वमतिदीर्घं च बुध्दिमान्॥

Tatra ---- buddhimaan [*Verse* 44] [4]

दृष्टः प्रथमरात्रे यः स्वप्नः सोऽल्पफलो भवेत्। न स्वपेद्यं पुनर्दृष्ट्वा स सद्यः स्यान्महाफलः॥

Drushta ---- mahaphala [*Verse* 45] [4]

'*Drishta'* (seen), '*Shruta'* (heard), '*Anubhuta'* (experienced), '*Prarthita'* (desired / wished), and '*Kalpita'* (imaginary) types of dreams are unproductive or futile whereas '*Bhavika'* (feelings), and '*Doshaja'* (due to internal imbalances or organic) types of dreams are effective or productive. Dreams which are seen during daytime, having too long or short duration and occur at first quarter of the night are having minimum effect (*Alpa phala*). Dreams which cause disturbances of sleep (nightmares) are very effective and have stronger impact (*Maha phala*). दृष्टं श्रुतानुभूतं च प्रार्थितं कल्पितम् types of dreams are derived from various external and/or internal sensory stimuli. Due to imaginary nature and lack of strong underlying wish or desire etc makes these types of dreams as futile or ineffective. Day dreams are incoherent in nature and they are also futile. भाविकम् and दोषजम् types of dreams may be effective due to their stronger intensity, having originated from unconscious forbidden wishes and having organic underlying source.

The frequency of 'Anxiety dreams' in diseases of the heart and lungs has been generally realized. The dreams of persons suffering from diseases of the heart are generally very brief, and end in a terrified awakening; death under terrible circumstances almost always finds a place in their content (न स्वपेद्यं पुनर्दृष्ट्वा स सद्यः स्यान्महाफलः). [34] RBD (REM sleep behaviour disorder occurs during REM (rapid eye movement sleep) which is characterized by higher amounts of aggressive dream content. It has been found that patients of Wilson's disease (WD) with RBD have reported significantly more aggressive dream contents (न स्वपेद्यं पुनर्दृष्ट्वा). Dream length is strongly related to verbal memory. Reduced dream length (अतिह्रस्वम्) indicates that cognitive deficits in WD have an effect on dream recall. [35] Changes in the amount and quality of dreams may indicate neurological damage (दोषजम्). Lesions of the right hemisphere are associated with deficits in visual imagery, whereas those in the left hemisphere may result in loss of structure and context of dream imagery. Damage to the frontal lobes may leads to difficulty in remembering dreams. Patients with narcolepsy have vivid, bizarre, often frightening, dreams which are related to alterations in the amount or quality of REM sleep. [33] NREM (non-rapid eye movement) dreams (दृष्टः प्रथमरात्रे यः) are typically shorter, more fragmented and more thought-like whereas REM dreams are longer, more emotional, and more bizarre. Attributes such as length (अतिह्रस्वमतिदीर्घम्), bizarreness, and perceptual vividness increase for both NREM and REM sleep reports across the night, although REM sleep dreams continue to be more emotionally (भाविकम्) and perceptually vivid than NREM dreams. [37]

अकल्याणमपि स्वप्नं दृष्ट्वा तत्रैव यः पुनः। पश्येत् सोम्यं शुभाकारं तस्य विद्याच्छुभं फलम्॥

Akalyaanamapi ---- phalam [*Verse* 46] [4]

Inauspicious dream followed by auspicious dream brings good fortunes. Auspicious dreams and their positive benefits may be due to strong underlying desire or unconscious wish or forbidden wishful impulses which altogether makes the dream reality. The nature of the dreams and their positive benefits depends on various factors as explained in the above sections.

CONCLUSION:

Prodromal symptom severity indicates the prognosis of a disease. Oneirology is the scientific study of dreams. Physiology, classification, and different types of dreams in various diseases are described. Prospective controlled studies, longitudinal prospective cohort studies and retrospective studies are required to establish the facts mentioned in this chapter. Questionnaires should be developed to measure the different dimensions of dreaming qualitatively and quantitatively in different diseases and healthy individuals. Various technological advances like fMRI (functional magnetic resonance imaging), Polysomnography, sleep study laboratory, and EEG (electro encephalography) etc should be incorporated to study dreams explained in *Ayurveda* in the context of diseases and health. 'Interpretation of dreams'

authored by 'Sigmund Freud' and other relevant works on dreams, should be implemented to interpret various dreams explained in *Ayurvedic* texts.

Table 1: *Arishta lakshanas* related to prodromal symptoms

Purvarupa arishta lakshana	**Relevant disease or pathology**
पूर्वरूपाणि सर्वाणि ज्वरोक्तान्यतिमात्रया *Purvarupaani --- maatraya* (Ch. I. 5 / 4)	For ex: severe prodromal symptoms in 'Hemorrhagic Small pox'; presence of all prodromal features in 'Plasmodium Falsiparum Malaria'; mild neurological symptoms during catarrhal phase of Measles indicative of 'Encephalitis';
बलं च हीयते यस्य प्रतिश्यायश्च वर्धते शोषोऽन्तायोपजायते *Balam cha --- upajaayate* (Ch. I. 5 / 7)	Cachexia / severe weight loss or muscle wasting in 'Nasal and Sinus tuberculosis'; Tuberculosis with HIV or associated other sexually transmitted infections; Immuno-compromised or immunodeficiency conditions;
लाक्षारक्ताम्बराभं यः पश्यत्यम्बरमन्तिकात् स रक्तपित्तमासाद्य *Lakshaa --- maasaadya* (Ch. I. 5 / 10)	Charles Bonnet Syndrome (CBS); Hepatic Encephalopathy (HE); Rupture of cerebral Aneurysm; Vascular dementia; Hypertensive Encephalopathy; Vascular neuro-ophthalmological conditions;
शूलाटोपान्त्रकूजाश्च दौर्बल्यं चातिमात्रया नखादिषु च वैवर्ण्ये गुल्मानान्तकरो *Shulaatopa --- antahkaro* (Ch. I. 5 / 12)	Gastric or duodenal ulcers; Gastric cancer; Oesophagitis; Oesophageal varices; Intra abdominal tumours; Acute abdomen; Abdominal tuberculosis; Chronic recurrent bleeding from gastro-intestinal tract;
कायेऽल्पमपि संस्पृष्टं सुभृशं यस्य दीर्यते क्षतानि च न रोहन्ति कुष्टे *Kaaye alpamapi --- kushte* (Ch. I. 5 / 14)	Basal cell carcinoma; Squamous cell carcinoma; Marjolin's ulcer; Chronic non healing ulcers due to immunodeficiency or diabetes or peripheral artery disease etc;
स्नातानुलिप्तगात्रेऽपि यस्मिन् गृध्नन्ति मक्षिकाः स प्रमेहेण *Snaata --- pramehena* (Ch. I. 5 / 16)	Various volatile organic compounds (VOCs) releasing from body due to an underlying disease (diabetes ketoacidosis or hyperglycemia etc) attracts mosquitoes or flies etc;
ध्यानायासौ तथोद्वेगौ मोहश्चास्थान संभवः अरतिर्बलहानिश्च *Dhyaana --- haanishcha* (Ch. I. 5 / 18)	Delirium; Organic psychosis;
आहारद्वेषिणं पश्यन् लुप्तचित्तमुदर्दितम् *Aahaara --- udarditam* (Ch. I. 5 / 19)	Catatonia; Negative symptoms of Schizophrenia; Major depressive episode; Mood disorder;
क्रोधनं त्रासबहुलं सकृत्प्रहसिताननम्। मूर्च्छांपिपासाबहुलम् *Krodhanam --- bahulam* (Ch. I. 5 / 20)	Metabolic or Toxic encephalopathy; Personality change due to a general medical condition; Frontal lobe tumours; Panic attack or Panic disorder; Organic psychosis;
असत्तमः पश्यति यः श्रुणोत्यप्यसतः स्वनान् *Asattama --- svanaan* (Ch. I. 5 / 22)	Partial or focal seizures originating from visual cortical areas of occipital lobe; Auditory hallucinations of 'Temporal lobe epilepsy'; Space occupying lesions (SOL) in occipital or temporal lobes or in brain stem;
स्तभ्येते प्रतिबुध्दस्य हनू मन्ये तथाऽक्षिणी। यस्य तं बहिरायामो *Stabhyete --- bahirayamo* (Ch. I. 5 / 24)	Trismus & Opisthotonus of Tetanus;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

Table 2: Analysis of dreams

Dream	**Analysis**
श्वभिरुष्ट्रैः खरैर्वाऽपि --- स्वप्ने यक्ष्माणम् *Shvabhi -- yakshmanam* (Ch. I. 5 / 8)	Draught animals (dog, camel and donkey etc) are the 'Symbolic representations' of 'Cachexia' in Tuberculosis; The owner of south direction is '*Yama'* (God of death); Source of the dream content is 'Internal organic somatic stimuli'.
प्रेतैः सह पिबेन्मद्यं --- ज्वरमासाद्य *Pretai --- maasaadya* (Ch. I. 5 / 9)	Getting dragged by dogs in dreams, here dog is the 'Symbolic representation' of *Jwara* (fever) and '*Preta'* for death; *Madya* (alcoholic beverages) denotes 'Displacement' mechanism of dream.
रक्तस्रग्रक्तसर्वाङ्गो --- रक्तं प्राप्य *Rakta --- praapya* (Ch. I. 5 / 11)	Red colour (apparels, garlands and items like Lac etc) objects in dreams are the 'Displacements' or 'Symbolic representations' of blood. Laughing in this dream is the 'Modification' or 'Inversion' or 'Displacement' for the original feeling crying. Woman is the 'displacement' for the disease '*Rakta pitta'*.
लता कण्टकिनी --- गुल्मस्तमन्ताय *Lataa --- antaaya* (Ch. I. 5 / 13)	Creeper in the dream is the 'Symbolic representation' of '*Gulma'*. '*Lata'* also represents symbolically the haematogenous or vascular, lymphatic and transcoelomic spread of tumours or pathways of metastasis.
नग्नस्याज्या --- कुष्टैर्मरिष्यतः *Nagna --- arishyata* (Ch. I. 5 / 15)	Nakedness in the dream represents 'Social stigma' or 'Ashamedness' or 'Embarrassment' due to '*Kushta'*. Excessive '*Snigdhata'*, '*Sheetata'* and '*Mandagni'* in dreams represent the aetiology of *Kushta*. Blossoming lotus flower represents 'Mud' or morbid *dosha's* in *Kushta*.
स्नेहं बहुविधं स्वप्ने --- स प्रमेहेण *Sneham --- pramehena* (Ch. I. 5 / 17)	This dream represents the etiology of '*Prameha'*. '*Sneha'* denotes nutrient-dense foods; Source of the dream content is 'Internal organic stimuli'.
नृत्यान् रक्षोगणैः --- भृशमुन्मादम् *Nrutyaan --- unmaadam* (Ch. I. 5 / 21)	Dancing may be symbolic representation for 'Disinhibition' or 'Mood lability' or 'Mania'; Absurd combinations of ideas and weakness of judgment are the characteristic features of dreams in insanity.

मत्तं नृत्यन्तमाविध्य --- यं नरम् *Mattam --- naram* (Ch. I. 5 / 23)	'*Preta'* in dreams denotes death and to neutralize or reduce the anxiety associated with the idea of death, 'Dancing with euphoria' might be added in this dream. Dancing also symbolically represents 'excessive abnormal movements' seen in seizures.
शष्कुलीर्वाऽप्यपूपान् ---चेत्तादृक् छर्दयति *Shushka --- chardayati* (Ch. I. 5 / 25)	'Dreams come from the stomach'. Present dream indicates excessive muscular rigidity and spasms of the pharyngeal muscles (causes nausea, vomiting, difficulty in swallowing etc) seen in Tetanus which leads to death.
यस्योत्तमाङ्गे जायन्ते --- रोगी यैर्याति पञ्चताम् *Yasya --- panchataam* (Ch. I. 5 / 28-40)	Various dreams mentioned in this chapter have the following common phenomenon (all of them represents various internal organic pathology); **Dream type:** Anxiety or Punishment or Absurd dreams **Dream source:** Internal organic pathology / somatic stimuli **Dream objects / symbols:** Various places, articles, people, animals etc; **Dream mechanisms:** Displacements, Representations, Projections, Secondary revisions, Inversions, and Condensations

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number;

REFERENCES:

1. Sharma H. Ayurveda: Science of life, genetics, and epigenetics. Ayu. 2016; 37 (2): 87-91. doi: 10.4103/ayu.AYU_220_16. PMID: 29200745; PMCID: PMC5688840.
2. Panja A. A critical review of rhythmic recitation of Charaka samhita as per chhanda shastra. AYU 2013; 34 (2): 134-142. doi: 10.4103/0974-8520.119665
3. Nipane MS, Bharat C, Namrata C, Bhushan M. Relevance of Indriya sthan in the prognosis of diseases: A review. Int J Res Ayurveda Pharm 2018; 9 (1): 9-12. doi: 10.7897/2277-4343.0913
4. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 5th chapter: Indriyaaneekam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 361-363.
5. Chung Y, Jacobson A, He G, van Erp TG, McEwen S, Addington J, Bearden CE, Cadenhead K, Cornblatt B, Mathalon DH, McGlashan T. Prodromal symptom severity predicts accelerated gray matter reduction and third ventricle expansion among clinically high-risk youth developing psychotic disorders. Mol Neuropsychiatry. 2015; 1 (1):13-22. doi: 10.1159/000371887
6. Held EP, Chugh SS. Warning signs of impending acute cardiac events: implications for mobile and wireless technology. Circulation. 2018; 138 (16):1617-1619. doi: 10.1161/CIRCULATIONAHA.118.036217
7. Lopez EL, Devoto S, Fayad A, Canepa C, Morrow AL, Cleary TG. Association between severity of gastrointestinal prodrome and long-term prognosis in classic hemolytic-uremic syndrome. J. Pediatr. 1992; 120 (2): 210-215. doi: https://doi.org/10.1016/S0022-3476(05)80429-9
8. Du WJ, Liu L, Sun C, Yu JH, Xiao D, Li Q. Prodromal fever indicates a high risk of liver failure in acute hepatitis B. International Journal of Infectious Diseases. 2017; 57: 98-103. doi: https://doi.org/10.1016/j.ijid.2017.02.009
9. Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), Division of High-Consequence Pathogens and Pathology (DHCPP). Clinical disease - Small pox. Available from: https://www.cdc.gov/smallpox/clinicians/clinical-disease.html
10. Bartoloni A, Zammarchi L. Clinical aspects of uncomplicated and severe malaria. Mediterr J Hematol Infect Dis. 2012;4(1):e2012026. doi: 10.4084/MJHID.2012.026. Epub 2012 May 4. PMID: 22708041; PMCID: PMC3375727.
11. Pampiglione G. Prodromal phase of measles: Some Neurophysiological studies. Brit. Med. J. 1964; 2: 1296-1300. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1817338/pdf/brmedj02577-0038.pdf
12. Mager A, Berger D, Ofek H, Hammer Y, Iakobishvili Z, Kornowski R. Prodromal symptoms predict myocardial involvement in patients with acute idiopathic pericarditis. Int J Cardiol. 2018; 270: 197-199. doi: https://doi.org/10.1016/j.ijcard.2018.05.128
13. Crevel RV, Karyadi E, Netea MG, Verhoef H, Nelwan RHH, West CE, van der Meer JWM, Decreased Plasma Leptin Concentrations in Tuberculosis Patients Are Associated with Wasting and Inflammation. J Clin Endocrinol Metab. 2002; 87 (2): 758–763. https://doi.org/10.1210/jcem.87.2.8228
14. Dixit R, Dave L. Primary nasal tuberculosis. Lung India. 2008; 25 (2): 102-103. doi: 10.4103/0970-2113.44127. PMID: 20165659; PMCID: PMC2822326.
15. Dharmadhikari AS, Gupta J, Decker MR, Raj A, Silverman JG. Tuberculosis and HIV: a global menace exacerbated via sex trafficking. Int J Infect Dis. 2009; 13 (5): 543-546. doi: https://doi.org/10.1016/j.ijid.2008.11.010
16. Kulchavenya E, Osadchiy A, Khomyakov V. Tuberculosis as a reason for male and female sexual dysfunction. Ann Infect Antibiotics. 2017; 1:101. Available from: https://www.omicsonline.org/open-access/tuberculosis-as-a-reason-for-male-and-female-sexual-dysfunctionreview.pdf
17. Nagelkerke NJ, de Vlas SJ, MacDonald KS, Rieder HL. Tuberculosis and Sexually Transmitted Infections. Emerg Infect Dis. 2004; 10 (11): 2055-2056. https://dx.doi.org/10.3201/eid1011.030785
18. Al-Saeed T, El-Zaiat ES. Modeling of vision loss due to vitreous hemorrhage by Monte Carlo simulation. J Biomed Opt. 2014; 19 (8): doi: 10.1117/1.JBO.19.8.085009
19. De la Garza MM, Joven MH, Lowe K, Tieu C, Tung E. A Case of Mistaken Hematochezia: Charles Bonnet Syndrome as a Mimicker of Gastrointestinal Bleed. J Am Med Dir Assoc. 2017; 18 (3): B3. doi: https://doi.org/10.1016/j.jamda.2016.12.009
20. Riggio O, Nardelli S, Gioia S, Lucidi C, Merli M. Management of hepatic encephalopathy as an inpatient. Clinical Liver Disease. 2015; 5 (3): 79-82. doi: 10.1002/cld.457
21. Lancaster-Smith M, Williams KGD (1982). Gastrointestinal bleeding. In: Problems in Gastroenterology. Problems in Practice Series (Vol 7). Springer: Dordrecht. doi: https://doi.org/10.1007/978-94-011-7206-6_10
22. InformedHealth.org [Internet]. Cologne, Germany: Institute for Quality and Efficiency in Health Care (IQWiG); 2006. Chronic wounds: Overview. 2006 Oct 17 [Updated 2018 Jun 14]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK326431/
23. Danquah I, Bedu-Addo G, Mockenhaupt FP. Type 2 diabetes mellitus and increased risk for malaria infection. Emerg Infect Dis. 2010; 16 (10): 1601-1604. doi: 10.3201/eid1610.100399. PMID: 20875289; PMCID: PMC3294394.
24. Fernández-Grandon GM, Gezan SA, Armour JA, Pickett JA, Logan JG. Heritability of attractiveness to mosquitoes. PLoS One. 2015; 10 (4). e0122716. doi:10.1371/journal.pone.0122716.
25. Keswani RK, Bellare JR. A review of mosquito attraction studies: important parameters and techniques. Res. J. Parasitol. 2006; 1: 31-41. doi:10.3923/jp.2006.31.41.
26. American Psychiatric Association (APA). Diagnostic and Statistical Manual of Mental Disorders – Text Revision (DSM-IV-TR). Delirium, Dementia, and Amnestic and other

cognitive disorders – Delirium. 4th edition. New Delhi: Jaypee Publications; 2000. p. 136-140.
27. American Psychiatric Association (APA). Diagnostic and Statistical Manual of Mental Disorders – Text Revision (DSM-IV-TR). Schizophrenia and other psychotic disorders – Schizophrenia. 4th edition. New Delhi: Jaypee Publications; 2000. p. 315-316.
28. American Psychiatric Association (APA). Diagnostic and Statistical Manual of Mental Disorders – Text Revision (DSM-IV-TR). Schizophrenia and other psychotic disorders – Schizophrenia. 4th edition. New Delhi: Jaypee Publications; 2000. p. 298-302.
29. Berisavac II, Jovanović DR, Padjen VV, Ercegovac MD, Stanarčević PD, Budimkić-Stefanović MS, Radović MM, Beslać-Bumbaširević LG. How to recognize and treat metabolic encephalopathy in Neurology intensive care unit. Neurology India. 2017; 65 (1): 123-128. doi: 10.4103/0028-3886.198192
30. Ali S, Patel M, Avenido J, Bailey RK, Jabeen S, Riley WJ. Hallucinations: Common features and causes. Curr Psychiatr. 2011; 10 (11): 22-29. Available from: https://mdedge-files-live.s3.us-east-2.amazonaws.com/files/s3fs public/Document/September-2017/1011CP_Ali.pdf
31. Hassel B. Tetanus: pathophysiology, treatment, and the possibility of using botulinum toxin against tetanus-induced rigidity and spasms. Toxins (Basel). 2013; 5 (1): 73-83. doi: 10.3390/toxins5010073. PMID: 23299659; PMCID: PMC3564069.
32. Munishwar DS, Pandey A, Srivastava M, Singh R. Assessment of dreams in context to health and disease: Traditional Indian understanding. Int J Yoga - Philosop Psychol Parapsychol 2019; 7: 10-16. doi: 10.4103/ijny.ijoyppp_3_18
33. Katz M, Shapiro CM. ABC of sleep disorder. Dreams and medical illness. Br Med J. 1993; 306 (6883): 993-995. doi: 10.1136/bmj.306.6883.993
34. Freud S. The interpretation of dreams Sigmund Freud (1900). Available from: http://library.manipaldubai.com/DL/The_Interpretation_Of_Dreams.pdf
35. Tribl GG, Trindade MC, Schredl M, Pires J, Reinhard I, Bittencourt T, Lorenzi-Filho G, Alves RC, de Andrade DC, Fonoff ET, Bor-Seng-Shu E. Dream recall frequencies and dream content in Wilson's disease with and without REM sleep behaviour disorder: a neurooneirologic study. Behav Neurol. 2016; 2016. doi: http://dx.doi.org/10.1155/2016/2983205
36. Rechtschaffen A. The single-mindedness and isolation of dreams. Sleep. 1978; 1 (1): 97-109.
37. Carr M, Solomonova E. Dream Recall and Content in Different Sleep Stages. Dreams: Biology, Psychology and Culture. Valli K, Hoss R, and Gongloff R. editors. Santa Barbara, CA: Denver, CO: Greenwood Publishing Group. 2018. p. 167-172.

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KATAMANI SHARIRIYAM OF *CHARAKA INDRIYA STHANA* - AN EXPLORATIVE STUDY

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REVIEW ARTICLE

KATAMANI SHARIRIYAM OF *CHARAKA INDRIYA STHANA*- AN EXPLORATIVE STUDY

Abstract:
'Katamani shaririyam indriyam' is the name of the sixth chapter of *Charaka samhita* (most popular text of an ancient Indian traditional medicine or *Ayurveda*), *Indriya sthana* (one among the eight secions of *Charaka samhita*, which deals with prognosis). *Indriya sthana* of *Charaka samhita* deals with various fatal signs and symptoms (*Arishta lakshanas*) which denote imminent death and also estimating survival time frames in dying patients. *Katamani shaririyam indriyam* deals with various fatal conditions which denote imminent death. The present study is aimed to explore the contents of '*Katamani shaririyam indriyam*' chapter and to analyse their role and potential in contemporary clinical prognostic practices. Various conditions such as 'Oesophageal carcinoma', 'Barret's oesophagus', 'Gastrooesophageal reflux disease' (GERD), 'Chronic diarrhoea', 'Intestinal tuberculosis', 'End stage renal disease' (ESRD), 'Chronic kidney disease' (CKD), 'Renal tuberculosis', 'End stage live disease' (ESLD), 'Cirrhosis of liver', 'Distal myopathies', 'Coeliac disease' (CD), 'Chonic obstructive pulmonary disease' (COPD), 'Lung cancers', 'Acute & chronic glomerulonephritis', 'Protein losing enteropathy' (PLE), 'Cancer cachexia', 'Tetanus', 'Hypoglycemic shock', 'Sarcopenia', 'Dementia', 'Delirium', 'Malabsorption syndrome', 'Acute myelocytic leukemia' (AML), 'Inflmmatory bowel disease', 'Intestinal obstruction', 'Tropical sprue', 'Crohn's disease', 'Ulcerative colitis', 'Lower gastrointestinal bleeding' (LGIB), 'Plummer–Vinson syndrome' (PVS), and concepts of comorbidity, multimorbidity etc have been explained in this chapter which are having prognostic significance. Further research works are required to substantiate the clinical findings mentioned in this chapter and also to establish the association between the manifestations of *arishta lakshanas* with death in different disease conditions as mentioned in this chapter.

Key Words: Cancer, Cachexia, Dementia, Delirium, End stage liver disease, End stage renal disease

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INTRODUCTION:

Ayurveda is an ancient medical system of India. '*Charaka Samhita'* has been considered as the most important classical treatise on medicine in *Ayurveda*. It has been in use since ages for pursuing health among India and globally also. '*Acharya Charaka'* has narrated many important principles related to the health. [1] It is important for the physician to assess prognosis before initiating treatment. Among the eight sections of '*Charaka samhita'*, '*Indriya sthana*' is dedicated for prognostic aspects. Various '*Arishta lakshanas'* (fatal signs and symptoms which denotes imminent death) are explained in '*Indriya sthana'*, based on which prognosis of a disease or survival time frames can be calculated which further helps in clinical decision making. [2]

Indriya sthana consists 12 chapters and '*Katamani shaririyam'* is the 6th chapter which deals with '*Arishta lakshanas*' pertaining to various diseases or conditions commonly seen in dying patients. Acute or chronic, life threatening conditions which are having poor prognosis and concepts like comorbidity, multimorbidity etc have been explained in this chapter which are having prognostic significance. [3] The present study is aimed to explore the contents of '*Katamani shaririyam'* chapter and to analyse their role and potential in contemporary clinical prognostication.

MAIN CONTENTS (Table 1 & 2):

यस्य वै भाषमाणस्य रुजत्यूर्ध्वमुरो भृशम्। अन्नं च च्यवते भुक्तं स्थितं चापि न जीर्यति॥

बलं च हीयते शीघ्रं तृष्णा चातिप्रवर्धते। जायते हृदि शूलं च तं भिषक् परिवर्जयेत्॥

Yasya vai --- parivarjayet [*Verse* 5&6] [4]

The classic and most common symptom of GERD (Gastroesophageal reflux disease) is heartburn (हृदि शूलम्). GERD is a common cause of non-cardiac chest pain (हृदि शूलम्). Extra-esophageal symptoms are more likely due to reflux into the larynx, resulting in throat clearing and hoarseness (भाषमाणस्य रुजत्यूर्ध्वमुरो). GERD patients may also experience chronic nausea and vomiting (अन्नं च च्यवते भुक्तम्). Alarm symptoms include dysphagia (difficulty swallowing) and odynophagia (painful swallowing), which may represent presence of complications such as strictures, ulceration, and malignancy. Other alarm signs and symptoms include anemia, bleeding, and weight loss (बलं च हीयते). Left untreated, GERD can result in esophagitis and Barrett's esophagus. Esophagitis can lead to extensive erosions, ulcerations, narrowing of the esophagus and gastrointestinal (GI) bleeding. Upper GI bleeding may present as anemia (बलं च हीयते), hematemesis, coffee-

ground emesis, melena, and hematochezia. [5] Barrett's oesophagus is a condition characterised by partial replacement of the normal squamous epithelium of the lower oesophagus by a metaplastic columnar epithelium. Barrett's oesophagus is important clinically because those afflicted are predisposed to oesophageal adenocarcinoma. The longstanding clinical association between Barrett's oesophagus and acid regurgitation or heartburn has been confirmed in research studies. Clinical interest in Barrett's oesophagus stems largely from the concern that the condition is a precursor or risk marker for adenocarcinoma of the oesophagus. [6] Plummer–Vinson syndrome (PVS) is characterized by a triad of dysphagia, iron deficiency anemia and esophageal web in the post-cricoid region. PVS is associated with an increased risk of hypopharyngeal and esophageal malignancies. [7] 'तृष्णा चातिप्रवर्धते' may be due to anaemia or chronic GI bleeding. It seems that the condition explained in the above verse indicates esophageal carcinoma manifested from GERD or Barret's oesophagus or PVS.

हिक्का गम्भीरजा यस्य शोणितं चातिसार्यते। न तस्मै भेषजं दद्यात् स्मरान्नात्रेयशासनम्॥

Hikka --- shaasanam [*Verse* 7] [4]

GERD is commonly associated with belching. Apart from the main reflux symptoms in terms of acid regurgitation, heartburn, globus, dysphagia and hoarseness etc, hiccup is common among the GERD patients. Since severe belching may sometime precede the hiccup episode, perhaps belching is the mechanism leading to hiccup among the GERD subjects. Increased acid production following H.pylori infection stimulates esophageal mucosa which irritates vagal afferents. Serious hiccup (हिक्का गम्भीरजा) is not unusual among the cancer patients. [8] Hiccups are also seen in various gastrointestinal disorders like bowel obstruction, esophageal cancer, esophagitis (infectious or erosive), gallbladder disease, hepatitis, neoplasms, pancreatitis, peptic ulcer disease, stomach volvulus, and subphrenic abscess. [9] Hiccups are common in gastric cancers, Crohn's disease, ulcerative colitis and bowel obstruction. [10] Acute LGIB (lower gastrointestinal bleeding) (शोणितं चातिसार्यते) classically presents with sudden onset of hematochezia (maroon or red blood passed per rectum). Patients with bleeding from the cecum or right colon can present with melena (black, tarry stools). The most common causes of acute severe LGIB include diverticulosis, angioectasia, ischemic colitis, colorectal polyps or neoplasms, Dieulafoy's lesion, inflammatory bowel disease, anorectal conditions like solitary rectal ulcer, and rectal varices. [11] The condition mentioned in the above verse denotes carcinoma of lower gastrointestinal tract or Crohn's disease or ulcerative colitis or hepatic pathology.

अनाहश्च अतिसारश्च यमेतौ दुर्बलं नरम्। व्याधितं विशतो रोगौ दुर्लभं तस्य जीवितम्॥

Aanaahashcha --- jeevitam [*Verse* 8] [4]

Chronic small bowel diarrhoea (अतिसारश्च) with malabsorption continues to be a major public health problem. Celiac sprue is most common in the west and tropical sprue is most common in the developing world. Tropical sprue and parasitic diseases (giardiasis, strongyloidiasis, cryptosporidiosis, microsporidiosis, isosporidiosis) are two leading causes of chronic diarrhoea with malabsorption in tropical countries. Most common causes of chronic diarrhoea (CD) (अतिसारश्च) are tropical sprue, parasitic infection, intestinal tuberculosis, immunodeficiency, celiac disease, small intestinal bacterial overgrowth (SIBO), Crohn's disease and metastatic carcinoid. Chronic diarrhoea is associated with anemia, hypoalbuminemia, micronutrient deficiencies, and weight loss (दुर्बलम्). Borborygmi (अनाह), abdominal pain and undigested food particles in stool are also seen in tropical sprue. [12]

आनाहश्चातितृष्णा च यमेतौ दुर्बलं नरम्। विशतो विजहत्येनं प्राणा नातिचिरान्नरम्॥

Aanaahashcha --- naram [*Verse* 9] [4]

Various conditions like intestinal obstruction, tuberculous peritonitis, carcinomas of gastrointestinal tract, amoebic colitis, sigmoid volvulus, malabsorption syndrome, typhoid enteritis, inflammatory bowel disease and blind-loop syndrome etc may denote the condition mentioned in the above verse. Conditions like 'Subacute (leaking) or chronic perforation of peptic ulcer' and internal haemorrhage inside gastrointestinal tract (which may cause अतितृष्णा & आनाह also resemble with the condition mentioned in the above verse.

ज्वरः पौर्वाह्णिको यस्य शुष्ककासश्च दारुणः। बलमांसविहीनस्य यथा प्रेतस्तथैव सः॥

Jwara --- pretastathaiva sa [*Verse* 10] [4]

There was a case reported of TB (tuberculosis) of mediastinal lymph node combined with pulmonary mucormycosis that was presented as obstructive pneumonia combined with lymphoma. Pulmonary mucormycosis is one of fatal opportunistic fungal infection often happened in the immunocompromised host, such as patients with diabetes mellitus, hematological malignancy, or cancer. The infection was accompanied by a high mortality rate. Fever (ज्वरः), cough (शुष्ककासश्च), and hemoptysis are main symptoms of pulmonary mucormycosis. [13] Another case report with fever (ज्वरः) and dry cough (शुष्ककासश्च) was diagnosed as pulmonary tuberculosis with acute myelocytic leukemia (AML) (बलमांसविहीनस्य?) and mediastinal masses. [14] Cough can be produced by cancer (बलमांसविहीनस्य?) either directly or indirectly (directly by pulmonary parenchymal involvement, lymphangitic carcinomatosis, intrinsic or extrinsic obstruction of

airway by tumour, pleural effusion or tumour, multiple tumour microemboli, pulmonary leukostasis, and superior vena cava syndrome; indirectly by anorexia-cachexia syndrome, paraneoplastic syndrome, and pulmonary embolus or aspiration etc). [15] Patients with 'Lung adenocarcinoma' may also present with chronic dry (non-productive) cough (शुष्ककासश्च). [16]

यस्य मूत्रं पुरीषं च ग्रथितं संप्रवर्तते। निरूष्मणो जठरिणः श्वसनो न स जीवति॥

Yasya mutram --- na sa jeevati [*Verse* 11] [4]

Cardiovascular disease (CVD) is the most common extra-pulmonary presentation of COPD (Chronic obstructive pulmonary disease). Patients with COPD (श्वसनो / dyspnoea) had a significantly higher prevalence of ischemic heart disease, cerebrovascular disease, and peripheral vascular disease (निरूष्मणो due to reduced blood flow) compared non-COPD patients. Albuminuria is common in COPD patients and it independently correlates significantly with hypoxemia. Abnormal urine albumin (albuminuria and proteinuria) (मूत्रं ग्रथितम्) was prevalent in patients with CVD. Albuminuria in patients with COPD is also common in other associated co-morbidities including 'Chronic kidney disease' (CKD), (मूत्रं ग्रथितम) Pulmonary arterial hypertension (PAH), and atherosclerosis as a result of systemic endothelial dysfunction. Patients with COPD have shown to have endothelial injury pathways in the lungs and kidneys. [17]

Glomerulonephritis is an important cause of renal impairment which may leads to end stage renal failure. Acute glomerulonephritis may present as nephritic syndrome—that is with haematuria, proteinuria, and impaired renal function together with hypertension, fluid overload, and oedema. Various diseases which can cause 'Acute glomerulonephritis' are, post infectious glomerulonephritis (post streptococcal, bacterial, viral and parasitic infections), IgA nephropathy, Henoch-Schonlein purpure, Wegener's granulomatosis, microscopic polyangiitis, idiopathic crescentic glomerulonephritis, Anti glomerual basement membrane disease, infective endocarditis, visceral abscesses, infected arteriovenous shunts, and systemic lupus erythematosus. [18] निरूष्मणो जठरिणः denotes either compromised circulation or anorexia or hypothermia. The condition mentioned in the above verse may also denotes various other conditions like 'Urogenital or renal tuberculosis' or 'Chronic kidney disease' (CKD), or 'End stage renal disease' (ESRD).

श्वयथुर्यस्य कुक्षिस्थो हस्तपादं विसर्पति। ज्ञातिसङ्गं स संक्लेश्य तेन रोगेण हन्यते॥

Svayadhu --- hanyate [*Verse* 12] [4]

In end stage liver disease (ESLD), accumulation of fluid as ascites, edema or pleural effusion due to cirrhosis is common. Fluid retention is the most frequent complication of ESLD which is occurring in about 50% of patients within 10 years of the diagnosis of cirrhosis and it is associated with poor prognosis (तेन रोगेण हन्यते). Ascites, spontaneous bacterial peritonitis (SBP), hepatorenal syndrome (HRS), hepatic hydrothorax and lower extremity edema (हस्तपादं विसर्पति) are major complications (तेन रोगेण हन्यते) in this setting. Ascites is defined as an excessive amount of fluid that develops within the peritoneal cavity (श्वयथुर्यस्य कुक्षिस्थो). Movement of ascitic fluid (विसर्पति) as a result of negative intra-thoracic pressure and positive intraabdominal pressure from the peritoneal cavity into the pleural space through diaphragmatic defects seems to result in hepatic hydrothorax formation. [19] The condition mentioned in the above verse indicates ESLD or cirrhosis of live with Ascites later causing peripheral edema.

श्वयथुर्यस्य पादस्थस्तथा स्रस्ते च पिण्डिके। सीदतश्चाप्युभे जङ्घे तं भिषक् परिवर्जयेत्॥

Svayadhu --- parivarjayet [*Verse* 13] [4]

Three groups of 'Peroneal muscular atrophy' conditions are currently recognised: a demyelinating form, hereditary motor and sensory neuropathy type I (HMSN-I or Charcot-Marie-Tooth disease 1 (CMT-1)); an axonal form, HMSN-II or CMT-2; and distal hereditary motor neuronopathy (dHMN also known as distal spinal muscular atrophy or spinal CMT). The clinical features of all three forms are similar, distal muscle wasting and weakness, variable sensory loss, diminished or absent deep tendon reflexes, and pes cavus deformity of the foot. [20] 'Miyoshi distal myopathy' is characterized by weakness in the gastrocnemii muscles, difficulty in walking on toes or climbing stairs, and calf myalgia. Gastrocnemius muscle hypertrophy (स्रस्ते च पिण्डिके) is followed by wasting (सीदतश्चाप्युभे जङ्घे) and loss of the ankle muscle stretch reflexes at a later point. With disease progression, there is some proximal leg weakness with the hamstring muscle group being weaker than the quadriceps. Progression is variable. Muscle MRI confirms selective involvement of the posterior compartment muscles of the leg compared to those of the anterior compartment (स्रस्ते च पिण्डिके). The quadriceps femoris muscle when contracted, a portion of the muscle bulged out toward the anterolateral aspect at midthigh. Biopsy of a severely weak and wasted gastrocnemius muscle (सीदतश्चाप्युभे जङ्घे) typically shows end stage findings including extensive fibrosis, fatty replacement, with few myofibers. [21]

Various 'Distal myopathies' like, Myoshi myopathy (MM), Limb girdle muscular dystrophy (LGMD), Walender myopathy, Nonaka myopathy (NM), Laing myopathy, Markesberry-Griggs myopathy, Udd distal myopathy, Myofibrillar myopathy (MFM), Sporadic inclusion body myositis (IBM), Hereditary inclusion body myopathies (HIBM), Walender distal myopathy

(WDM), Tibila muscular dystrophy (TMD), Distal myopathy with rimmed vacuoles (DMRV), Hyaline body myopathy (HBM), Inflammatory myopathies, and Metabolic myopathies etc resemble with the description of the condition mentioned in above verse.

शूनहस्तं शूनपादं शूनगुह्योदरं नरम्। हीनवर्णबालाहारमौषधैर्नोपपादयेत्॥

Shuna hastam --- nopapadayet [*Verse* 14] [4]

A patient with Celiac disease (CD) may present with edema of the eyelids, pitting edema of hands (शूनहस्तम्), legs (शूनपादम्) and perigenital region (शूनगुह्योदरम्) along with hypo-proteinemia, hypo-albuminemia, hypo-globulinemia and hypercholesterolemia. Typical symptoms of CD are diarrhoea, abdominal distension, weight loss, failure to thrive, anorexia (हीनवर्णबालाहारम्) and irritability. Atypical presentation includes anaemia, short stature, delayed puberty, hepatitis, arthritis, ataxia, headache, depression, dermatitis herpetiformis and altered bone metabolism (हीनवर्णबालाहारमौषधै). Differential diagnosis of generalized edema is quite broad and various conditions should be kept in mind like, nephrotic syndrome, liver failure, protein losing enteropathy, and protein malnutrition. Numerous conditions can induce injury of intestinal mucosa and protein loss, such as inflammatory bowel disease, infections, gastrointestinal malignancy, milk protein allergy, celiac disease and Menetrier's disease. [22] The above verse denotes conditions like CD, malabsorption syndrome, malnutrition associated with oedema, Kwashiorkor in advanced cases of enteropathy etc.

उरोयुक्तो बहुश्लेष्मा नीलः पीतः सलोहितः। सततं च्यवते यस्य दूरात्तं परिवर्जयेत्॥

Uroyukto --- parivarjayet [*Verse* 15] [4]

Discoloured sputum (or respiratory discharge) is commonly interpreted by both patients and physicians as a clinical sign for the presence of bacterial infection. Bacterial yield from sputum colours green, yellow-green (पीतः), yellow (पीतः), and rust (सलोहितः) was higher than the yield from cream, white, or clear samples. [23] Black-pigmented sputum, also called "melanoptysis," (बहुश्लेष्मा नीलः) is a symptom that may be observed in certain pathologies such us coal workers' pneumoconiosis (anthracosis). Black-pigmented sputum (बहुश्लेष्मा नीलः) must be also distinguished from the expectoration of melanic pigment in cases of bronchopulmonary melanoma, and from certain uncommon fungal infections caused by the black yeast '*Exophiala dermatitidis'*, especially in patients suffering from cystic fibrosis, and by '*Aspergillus niger'* in case of COPD. [24] Various conditions like pulmonary mycoses in immunocompromised individuals, pulmonary tuberculosis, bronchiectasis, pulmonary abscesses, empyema, lung cancers and other chest infections denotes the description of the above verse.

हृष्टरोमा सान्द्रमूत्रः शूनः कासज्वरार्दितः। क्षीणमांसो नरो दूराद्वर्ज्यो वैद्येन जानता॥

Hrushta roma --- jaanataa [*Verse* 16] [4]

Cough, fever (कासज्वरार्दितः), weight loss (क्षीणमांसो), and anorexia are the common features of pulmonary tuberculosis. [25] Extra pulmonary tuberculosis (EPTB) is defined as an infection by Mycobacterium tuberculosis which affects tissues and organs outside the pulmonary parenchyma. EPTB results from the hematogenous and lymphatic spread of Mycobacterium tuberculosis bacilli. [26] Urosepsis can occur due to bacteraemia which may be characterized by hypoperfusion, hypothermia (< 36º C) (हृष्टरोमा), hypotension and septic shock.[27] Acute glomerulonephritis may present as nephritic syndrome, that is with haematuria, proteinuria (सान्द्रमूत्रः), and impaired renal function together with hypertension, fluid overload, and oedema (शूनः). [18] Various other conditions like chronic kidney disease (CKD), End stage renal disease (ESRD), and acute or chronic glomerulonephritis etc also resembles with the clinical condition mentioned in the above verse.

त्रयः प्रकुपिता यस्य दोषाः कष्टाभिलक्षिताः। कृशस्य बलहीनस्य नास्ति तस्य चिकित्सितम्॥

Traya --- chikitsitam [*Verse* 17] [4]

During last days of life (नास्ति तस्य चिकित्सितम), cancer patients experience progressive functional decline and worsening symptom burden (त्रयः प्रकुपिता यस्य दोषाः कष्टाभि लक्षिताः). Many symptoms such as anorexia, dysphagia and delirium could impair oral intake. These, coupled with refractory cachexia (कृशस्य बलहीनस्य), contribute to persistent weight loss (कृशस्य बलहीनस्य) and decreased quality of life. Furthermore, the inability to eat and drink and body image changes may contribute to significant emotional distress to patients. Nutritional compromise associated with decreased ability and desire to eat/drink and weight loss (कृशस्य). Patients often develop delirium in the last days of life. There are two major drivers of weight loss in the last days of life (नास्ति तस्य चिकित्सितम) starvation and refractory cachexia (कृशस्य बलहीनस्य). [28] The above verse indicates end stage of life due to various chronic disabling diseases (like carcinoma) with multi organ dysfunction and cachexia.

ज्वरातिसारौ शोफान्ते श्वयथुर्वा तयोः क्षये। दुर्बलस्य विशेषेण नरस्यान्ताय जायते॥

Jwara --- jaayate [*Verse* 18] [4]

The above verse denotes two different conditions, fever and diarrhoea as complications of edema and edema as a consequence of fever and diarrhoea in an immunocompromised or cachexia patient. Gastroenteritis is defined as a diarrheal disease, an increase in bowel movement frequency with or without vomiting, fever, and abdominal pain. Causes of gastroenteritis include bacterial, viral, fungal, and parasitic. Dehydration and depletion of electrolytes are the most common complications. Acute gastroenteritis

may transform in to chronic diarrhea which can lead to lactose intolerance or small-bowel bacterial overgrowth. Some other post-diarrhea complications include exacerbation of inflammatory bowel disease, septicemia, enteric fever, and Guillain-Barre syndrome and reactive arthritis (श्वयथुर्वा तयोः क्षये). [29] PLE is a complex, relatively common entity that occurs in a variety of GI as well as non-GI conditions. Protein losing enteropathy (PLE) has been associated with more than 60 different conditions, including nearly all gastrointestinal diseases (Crohn's disease, celiac, Whipple's, intestinal infections, and so on) and a large number of non-gut conditions (cardiac and liver disease, lupus, sarcoidosis, and so on). PLE in relation to the associated pathology for three different disease categories: increased lymphatic pressure (e.g., lymphangiectasis); diseases with mucosal erosions (e.g., lymphoma, Kaposi's sarcoma, Sarcoidosis, Ulcerative colitis, and Crohn's disease); and diseases without mucosal erosions (e.g., celiac disease, Whipple's disease, Systemic lupus erythematosus, and Cobalamin deficiency) (श्वयथुर्वा तयोः क्षये). [30]

Edema is caused by various conditions like heart failure, renal failure, liver failure, or problems with the lymphatic system. Edema manifests due to an elevation in capillary hydraulic pressure (heart failure, kidney failure, early cirrhosis, deep vein thrombosis, hepatic venous congestion etc) or increased capillary permeability (trauma, sepsis, allergic reactions, malignant ascites etc), a lower plasma oncotic pressure (hypoalbuminemia seen in nephritic syndrome, liver diseases, malnutrition etc), lymphatic obstruction (malignancy, post lymph node dissection) and combination of all these changes. The mortality rates are very high in patients of edema with failing organs (ज्वरातिसारौ शोफान्ते). [31] Primary immunodeficiency disorders (दुर्बलस्य विशेषेण) includes, combined variable immunodeficiency disease, Chediak-Higashi syndrome, Ataxia-telangiectasis, complement deficiencies, DiGeorge syndrome, hypogammaglobulinemia, job syndrome, leukocyte adhesion defects, Bruton disease, selective deficiency of IgA and Wiscott-Aldrich syndrome etc. The infectious diseases are the commonest presentations of these immunocompromised patients (दुर्बलस्य विशेषेण). Severity of infection depends on the degree of immunosuppression. Diarrhoea is a common clinical presentation in immunocompromised patients independent of the cause. [32] Fever and diarrhoea followed by edema denotes various underlying clinical conditions like PLE, ESRD (end stage renal disease), ESLD (end stage liver disease), immunodeficiencies, carcinomas, infective or septic endocarditis, cirrhosis of liver and tubercular glomerulonephritis etc. Edema followed by fever and diarrhoea denotes various complications of gastroenteritis.

पाण्डुरश्च कृशोऽत्यर्थं तृष्णयाऽभिपरिप्लुतः। डम्बरी कुपितोच्छ्वासः प्रत्याख्येयो विजानता॥

Pandu --- vijaanataa [*Verse* 18] [4]

Cachexia (कृशोऽत्यर्थम्) is a complication of many disorders and it is associated with an extremely poor prognosis. The wasting process affects particularly skeletal muscle causing extreme fatigue and weakness. Patients with cachexia also suffers with severe dyspnoea (डम्बरी कुपितोच्छ्वासः) along with weakness, asthenia and exhaustion due to various underlying conditions. [33] Hemorrhagic shock occurs in various conditions like gastrointestinal bleeding, coagulopathies, pulmonary embolus, lung cancer, cavitary lung diseases like tuberculosis and aspergillosis, ruptured major blood vessels and ruptured aneurysms. A person with severe bleeding may develop tachypnea (डम्बरी कुपितोच्छ्वासः) and hypotension. The loss of coronary perfusion pressure adversely affects myocardial contractility; cerebral blood flow decreases, resulting in the loss of consciousness, coma, and eventually death (प्रत्याख्येयो). [34] Internal haemorrhage is characterized by low blood pressure, increased pulse rate, increasing pallor (पाण्डुरश्च), restlessness, deep sighing respiration (air hunger) (डम्बरी कुपितोच्छ्वासः), cold and clammy extremities, and empty veins etc. 'तृष्णयाऽभिपरिप्लुतः' denotes excessive thirst due to hypovolemia due to internal haemorrhage.

हनुमन्याग्रहस्तृष्णा बलहासोऽतिमात्रया। प्राणाश्चोरसि वर्तन्ते यस्य तं परिवर्जयेत्॥

Hanu manya --- parivarjayet [*Verse* 19] [4]

The muscular rigidity and spasms of tetanus are caused by tetanus toxin (tetanospasmin), which is produced by a bacilli '*Clostridium tetani'*. Muscle rigidity and spasms in tetanus often manifests as trismus / lockjaw (हनुग्रह), neck stiffness (मन्याग्रह), dysphagia, opistotonus, or rigidity and spasms of respiratory (प्राणाश्चोरसि वर्तन्ते), laryngeal, and abdominal muscles, which may cause respiratory failure (प्राणाश्चोरसि वर्तन्ते). [35] Anaemia and exhaustion (बलहासोऽतिमात्रया) are severe due to repeated convulsions and due to dysphagia (difficulty of deglutition) and hyperpyrexia the patient may develop thirst (तृष्णा) also (intravenous fluid and electrolytes along with nasogastric tube for feeding are required to manage the case of tetanus). [36]

ताम्यत्यायच्छते शर्म न किञ्चिदपि विन्दति। क्षीणमांसबलाहारो मुमूर्षुरचिरान्नरः॥

Taamyati --- chiraannara [*Verse* 20] [4]

Hypoglycemia can occur due to various causes like hepatic, renal and cardiac failure, sepsis, inanition (क्षीणमांसबलाहारो), hormone deficiencies (cortisol, glucagon and growth hormone), non-beta cell tumours, endogenous and exogenous hyperinsulinism etc. [37] Bedside hypoglycemia is classified as slight, moderate, or severe depending on symptom severity. Slight hypoglycemia is characterized by the symptoms due to activation of the autonomic nervous system like

anxiety (शर्म न किञ्चिदपि विन्दति), tremor (आयच्छते), swelling, and tachycardia. In moderate hypoglycemia, symptoms arise from an inadequate supply of glucose to the brain, termed "neuroglycopenia"; symptoms vary widely depending on blood glucose levels and patient characteristics. Moderate hypoglycaemia is characterized by blurred vision (ताम्यति), drowsiness (ताम्यति), short-term memory loss, attention deficit or difficulty concentrating (शर्म न किञ्चिदपि विन्दति), defective psychomotor skills, numbness, impaired ability to remain awake (ताम्यति), neurological focalities (शर्म न किञ्चिदपि विन्दति), and seizures (आयच्छते). Severe hypoglycemia induces hypoglycemic coma (ताम्यति). [38] The above verse may also denote delirium or status epilepticus.

विरध्दयोनयो यस्य विरुध्दोपक्रमा भृशम्। वर्धन्ते दारुणा रोगाः शीघ्रं शीघ्रं स हन्यते॥

Viruddha --- hanyate [*Verse* 21] [4]

Comorbidity (any distinct additional entity (अनुबन्ध विकार) that has existed or may occur during the clinical course of a patient who has the index disease (अनुबन्ध्य विकार) under study) is associated with worse health outcomes (कृच्छ्रतमा नृणां दृश्यन्ते व्यधिसङ्करा:), more complex clinical management (प्रयोगापरिशुध्दत्वात्), and increased health care costs. Various other relevant terms to comorbidity are also conceptualized like multimorbidity (the co-occurrence of multiple chronic or acute diseases and medical conditions within one person without any reference to an index condition) (व्याधि सङ्करा:), morbidity burden (total burden of physiological dysfunction or the total burden of types of illnesses having an impact on an individual's physiologic reserve), and patient complexity (along with health related characteristics, influence of various other factors like socioeconomic, cultural, environmental and behavioural etc on morbidity burden). [39]

ते पूर्वं केवला रोगाः पश्चाद्धेत्वर्थकारिणः। उभयार्थकरा दृष्टास्तथैवैकार्यकारिणः॥
कश्चिद्धि रोगो रोगस्य हेतुर्भूत्वा प्रशाम्यति। न प्रशाम्यति चाप्यन्यो हेत्वर्थं कुरुतेऽपि॥
एवं कृच्छ्रतमा नृणां दृश्यन्ते व्यधिसङ्करा:। प्रयोगापरिशुध्दत्वात्तथा चान्योन्यसंभ वात्॥

Te purvam --- sambhavaat [*Verse* 20-22] [40]

एकोहेतुरनेकस्य तथैकस्यैक एव हि। व्याधेरेकस्य चानेको बहूनां बहवोऽपि च॥

Eko hetu --- bahavo api cha [*Verse* 24] [40]

लिङ्गं चैकमनेकस्य तथैवैकस्य लक्ष्यते। बहून्येकस्य च व्याधेर्बहूनां स्युर्बहूनि॥

Lingam --- bahuni [*Verse* 27] [40]

Four models of etiological association between conditions have been described: direct causation (the presence of first disease is directly responsible for another) (कश्चिद्धि रोगो रोगस्य हेतुर्भूत्वा), associated risk factors (the risk factors for first disease are correlated with the risk factor for another disease, making the simultaneous occurrence of the diseases more likely) (बहूनां बहवोऽपि), heterogeneity (disease risk factors are not correlated, but each is capable of causing diseases associated with the other risk factor) (व्याधेरेकस्य चानेको), and independence (the simultaneous presence of the diagnostic features of the co-occurring diseases actually corresponds to a third distinct disease) (बहूनि लिङ्गं एकस्य च). [39]

Time span and sequence are the relevant considerations in the context of comorbid disorders. The first refers to the span of time across which the co-occurrence of two or more conditions is assessed. The above verse denotes two different versions like, various clinical problems co-occur at the same point in time (न प्रशाम्यति चाप्यन्यो हेत्वर्थं कुरुते) and disorders co-occur across a period of time but not necessarily at the same time (कश्चिद्धि रोगो रोगस्य हेतुर्भूत्वा प्रशाम्यति). A distinct but related issue is the 'sequence' in which comorbidities appear, which may have important implications for genesis, prognosis, and treatment. Irrespective of the selected time span, the sequence in which diseases appear is also having importance in the study of etiological association (कश्चिद्धि रोगो रोगस्य हेतुर्भूत्वा प्रशाम्यति). [39]

There are plenty of ways in which specific diseases may interact in relation to diagnosis, prognosis, treatment, and management / outcomes. Even for the same pair of comorbid conditions, some interventions can be antagonistic (विरुध्दोपक्रमा), others may be agonistic, and others may be neutral. The word 'विरध्दयोनयो' denote, 'Heterotypic comorbidity' (disorders from different diagnostic groupings) or 'Discordant comorbidity' (diseases which are not directly related in terms of pathogenesis or management and doesn't share a common underlying predisposing factors); 'ivéXdaep³ma' denotes 'Antagonistic effect on coexisting disease' (treatment of one disease affecting the management of other disease adversely). [39]

बलंविज्ञानमारोग्यं ग्रहणी मांसशोणितम्। एतानि यस्य क्षीयन्ते क्षिप्रं क्षिप्रं स हन्यते॥

Balam --- hanyate [*Verse* 22] [4]

Cachexia is a complex metabolic process associated with underlying terminal illnesses (हन्यते) including end-stage renal disease, cancer, advanced heart and lung failure, and others. Patients with chronic diseases, including heart failure, chronic obstructive pulmonary disease, cancer, human immunodeficiency virus, and renal and hepatic failure become cachexic. Anorexia is one of the characteristic features of cachexia. Reduced muscle mass, muscle tone, and strength (मांसशोणितम् क्षीयन्ते) in cachexic patients are associated with increased risk of functional impairment, falls, disability, decreased physical performance, poorer quality of life (आरोग्यं क्षीयन्ते), and mortality (हन्यते). Cachexia is known to be associated with advanced dementia. The natural history of dementia (विज्ञानम् क्षीयन्ते) spans over 10 years, and the

later stages of the disease are marked by substantial unintentional weight loss, malnutrition (ग्रहणी क्षीयन्ते), sarcopenia (मांसशोणितम् क्षीयन्ते), anorexia (ग्रहणी क्षीयन्ते), lethargy (बलं क्षीयन्ते), altered immune function (आरोग्यं क्षीयन्ते), and cachexia. Along with the 'geriatric giants' (immobility, instability, incontinence, and impaired intellect/memory - विज्ञानम् क्षीयन्ते), four additional syndromes also evolved (frailty, sarcopenia, the anorexia of ageing, and dementia). [41] The above verse denotes 'Cachexia with advanced dementia', or 'Delirium'.

आरोग्यं हीयते यस्य प्रकृतिः परिहीयते। सहसा सहसा तस्य मृत्युर्हरति जीवितम्॥

Arogyam --- jeevitam [*Verse* 23] [4]

The above verse indicates different conditions like dementia from normal aging, age-associated cognitive impairment, mild cognitive impairment (MCI), cognitive decline due to chronic illness, delirium, aphasia and other focal cognitive syndromes (आरोग्यं हीयते). Delirium is an abrupt onset (सहसा सहसा तस्य) of cognitive decline characterized by fluctuating disturbances in attention, fluctuating course with lucid interval, disorientation, poor registration, perceptual disturbances, hallucinations, sundowning, altered sleep-wake cycle and increased or decreased activity level (प्रकृतिः परिहीयते). There can be various causative factors for delirium (आरोग्यं हीयते) like infections, metabolic or endocrinopathies, tumours, trauma, epilepsy, stroke and alcohol withdrawal. Intellectual impairment which comes on insidiously and gradually worsens over months or years without any associated neurological features suggests dementing diseases (प्रकृतिः परिहीयते). The early behavioural changes like personality changes (प्रकृतिः परिहीयते), loss of social and personal awareness, disinhibition, and compulsive and sociopathic acts etc can be seen in various dementias. [42]

CONCLUSION:

Wide variety of emergency, chronic debilitating conditions with poor prognosis are mentioned in this chapter like, oesophageal cancer, GERD, internal haemorrhages, acute abdomen, malabsorption syndrome, carcinomas of gastrointestinal tract, AML, ESRD, ESLD, lung adenocarcinoma, distal myopathies, COPD, bronchial carcinoma, CKD, PLE, pulmonary, cardiac and cancer cachexia, hypoglycaemic shock and tetanus etc. Concepts of comorbidity, multimorbidity and morbidity burden etc are mentioned in this chapter. Last few verses denote various senescence related neurodegenerative syndromes like Dementia and Delirium. Various measuring scales like 'The Charlson Index', 'Cumulative Illness Rating Scale (CIRS)', 'The Index of Coexisting Disease (ICED)', and 'The Kaplan Index' etc can be implemented in '*Ayurvedic* research' to find out the presence and severity of different diseases in the context of comorbidity. Based on the *Arishta lakshanas* explained in this chapter various 'Risk prediction models' can be developed to predict mortality or prognosis or high-risk patients in *Ayurveda*.

Table 1: *Arishta lakshanas* of various diseases (Part - 1)

Arishta lakshana	Relevant disease or condition
यस्य वै भाषमाणस्य रुजत्यूर्ध्वमुरो भृशम् --- हृदि शूलं च तं परिवर्जयेत *Yasya --- parivarjayet* (Ch. I. 6 / 5&6)	GERD (Gastro oesophageal reflux disease); Barrett's oesophagus; Plummer-Vinson syndrome (PVS); Adenocarcinoma of oesophagus;
हिक्का गम्भीरजा यस्य शोणितं चातिसार्यते न तस्मै भेषजं दद्यात् स्मरान्नात्रेयशासनम् *Hikka --- shaasanam* (Ch. I. 6 / 7)	Carcinoma of lower gastrointestinal tract; Crohn's disease; Ulcerative colitis; GERD; Cirrhosis of live;
अनाहश्च अतिसारश्च यमेतौ दुर्बलं नरम् व्याधितं विशतो रोगौ दुर्लभं तस्य जीवितम् *Aanaahashcha --- jeevitam* (Ch. I. 6 / 8)	Malabsorption syndrome; Tropical sprue; Intestinal tuberculosis; SIBO (small intestinal bacterial overgrowth); Crohn's disease; Metastatic carcinoid;
आनाहश्चातितृष्णा च यमेतौ दुर्बलं नरम् विशतो विजहत्येनं प्राणा नातिचिरान्नरम् *Aanaahashcha --- nnaram* (Ch. I. 6 / 9)	Subacute or chronic perforation of peptic ulcer; Internal haemorrhage in gastrointestinal tract; Carcinoma of GI tract; Malabsorption syndrome; Tuberculous peritonitis;
ज्वरः पौर्वाह्णिको यस्य शुष्ककासश्च दारुणः बलमांसविहीनस्य यथा प्रेतस्तथैव सः *Jwara --- pretastathaiva sa* (Ch. I. 6 / 10)	Pulmonary mucormycosis in immuno-compromised patients; Acute myelocytic leukemia (AML); Adenocarcinoma of lungs; Mediastinal lymphadenopathy;
यस्य मूत्रं पुरीषं च ग्रथितं संप्रवर्तते निरूष्मणो जठरिणः श्वसनो न स जीवति *Yasya --- jeevati* (Ch. I. 6 / 11)	Chronic obstructive pulmonary disease (COPD) with Cardiovascualr disease (CVD); Chronic kidney disease (CKD); Acute glomerulonephritis; ESRD (end stage renal disease);
श्वयथुर्यस्य कुक्षिस्थो हस्तपादं विसर्पति ज्ञातिसङ्गं स संक्लेश्य तेन रोगेण हन्यते *Shvayadhu --- hanyate* (Ch. I. 6 / 12)	ESLD (end stage live disease); Hepatorenal syndrome (HRS); Cirrhosis of live; Spontaneous bacterial peritonitis;

श्वयथुर्यस्य पादस्थस्तथा स्रस्ते च पिण्डिके सीदतश्चाप्युभे जङ्घे तं भिषक् परिवर्जयेत् *Shvayadhu --- parivarjayet* (Ch. I. 6 / 13)	Peroneal muscular atrophy; Distal myopathies; Charcot-Marie-Tooth disease (CMT);
शूनहस्तं शूनपादं शूनगुह्योदरं नरम् हीनवर्णबालाहारमौषधैर्नोपपादयेत् *Shoona --- nopapaadayet* (Ch. I. 6 / 14)	Celiac disease; Inflammatory bowel disease; Malabsorption syndrome; Protein losing enteropathy (PLE); Kwashiorker;
उरोयुक्तो बहुश्लेष्मा नीलः पीतः सलोहितः सततं च्यवते यस्य दूरात्तं परिवर्जयेत् *Uroyukto --- parivarjayet* (Ch. I. 6 / 15)	Opportunistic lung infections in immuno-compromised patients; COPD; Bronchiectasis; Pulmonary mycosis; Pulmonary tuberculosis; Lung abscesses; Empyema; Lung carcinoma;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

Table 2: *Arishta lakshanas* of various diseases (Part - 2)

Arishta lakshana	Relevant disease or condition
हृष्टरोमा सान्द्रमूत्रः शूनः कासज्वरार्दितः क्षीणमांसो नरो दूराद्वर्ज्यो वैद्येन जानता *Hrushta roma --- jaanataa* (Ch. I. 6 / 16)	Renal tuberculosis; Acute glomerulonephritis; Chronic kidney disease (CKD); ESRD (end stage renal disease); Nephrotic syndrome;
त्रयः प्रकुपिता यस्य दोषाः कष्टाभिलक्षिताः कृशस्य बलहीनस्य नास्ति तस्य चिकित्सितम् *Traya --- chikitsitam* (Ch. I. 6 / 17)	Delirium; Cardiac or Pulmonary or Cancer Cachexia; Carcinomas; Chronic debilitating conditions;
ज्वरातिसारौ शोफान्ते श्वयथुर्वा तयोः क्षये दुर्बलस्य विशेषेण नरस्यान्ताय जायते *Jwara --- jaayate* (Ch. I. 6 / 18)	Gastroenteritis complications; PLE (Protein losing enteropathy); ESRD; ESLD (end stage liver disease); Immunodeficiency disorders; Carcinomas;
पाण्डुरश्च कृशोऽत्यर्थं तृष्णयाऽभिपरिप्लुतः डम्बरी कुपितोच्छ्वासः प्रत्याख्येयो विजानता *Pandu --- vijaanataa* (Ch. I. 6 / 19)	Hemorrhagic shock; Hypovolemic shock; Internal haemorrhage; Delirium;
हनुमन्याग्रहस्तृष्णा बलह्रासोऽतिमात्रया प्राणाश्चोरसि वर्तन्ते यस्य तं परिवर्जयेत् *Hanu manya --- parivarjayet* (Ch. I. 6 / 20)	Tetanus;
ताम्यत्यायच्छते शर्म न किञ्चिदपि विन्दति क्षीणमांसबलाहारो मुमूर्षुरचिरान्नरः *Taamyate --- chiraannara* (Ch. I. 6 / 21)	Hypoglycaemic shock; Delirium; Status epilepticus;
विरुध्दयोनयो यस्य विरुध्दोपक्रमा भृशम् वर्धन्ते दारुणा रोगाः शीघ्रं शीघ्रं स हन्यते *Viruddha --- hanyate* (Ch. I. 6 / 22)	Heterotypic comorbidity; Discordant comorbidity; Antagonistic effect on coexisting disease; Various concepts of comorbdity, multimorbidity, morbidity burden and patient complexity
बलंविज्ञानमारोग्यं ग्रहणी मांसशोणितम् एतानि यस्य क्षीयन्ते क्षिप्रं क्षिप्रं स हन्यते *Balam --- hanyate* (Ch. I. 6 / 23)	Pulmonary or Cardiac or Cancer cachexia; Delirium; Dementia; Carcinomas;
आरोग्यं हीयते यस्य प्रकृतिः परिहीयते सहसा सहसा तस्य मृत्युर्हरति जीवितम् *Arogyam --- jeevitam* (Ch. I. 6 / 24)	Dementias; Delirium; Cachexia;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

REFERENCES:

1. Gupta K, Vyas H, Vyas M. Ahara kalpana in Charaka samhita - A critical review. Ayurpharm Int J Ayur Alli Sci. 2013; 2 (10): 302-310.
2. Ramakant D. Scientific and clinical explanation of Aristlakshanas described in Charaka samhita. Int J Ayu Pharm Chem 2017; 6 (1): 260-270.
3. Anurag V, Shreyasi B. Indriya sthana of Charaka samhita: A review. The Pharma Innovation Journal 2020; 9 (3): 13-16. Available from: http://www.thepharmajournal.com/archives/2020/vol9issue3/PartA/9-2-94-642.pdf
4. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 6th chapter: Katamani shaririyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 363-364.
5. Clarrett DM, Hachem C. Gastroesophageal Reflux Disease (GERD). Mo Med. 2018; 115 (3): 214-218. PMID: 30228725; PMCID: PMC6140167.
6. Whiteman DC, Kendall BJ. Barrett's oesophagus: epidemiology, diagnosis and clinical management. Med J Aust. 2016; 205 (7): 317-324. doi: 10.5694/mja16.00796
7. Goel A, Bakshi SS, Soni N, Chhavi N. Iron deficiency anemia and Plummer-Vinson syndrome: current insights. J Blood Med. 2017; 8: 175-184. doi: 10.2147/JBM.S127801. PMID: 29089792; PMCID: PMC5655134.
8. Chang FY, Lu CL. Hiccup: mystery, nature and treatment. J Neurogastroenterol Motil. 2012; 18 (2): 123-130. doi: 10.5056/jnm.2012.18.2.123. PMID: 22523721; PMCID: PMC3325297.
9. Cole JA, Plewa MC. Singultus (Hiccups) [Updated 2019 Jul 24]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK538225/
10. Launois S, Bizec JL, Whitelaw WA, Cabane J, Derenne JP. Hiccup in adults: an overview. Eur Respir J. 1993; 6 (4): 563-575. Available from: https://erj.ersjournals.com/content/erj/6/4/563.full.pdf

11. Strate LL, Gralnek IM. ACG Clinical Guideline: Management of Patients with Acute Lower Gastrointestinal Bleeding. Am J Gastroenterol. 2016; 111 (4): 459-474. doi: 10.1038/ajg.2016.41. Epub 2016. Erratum in: Am J Gastroenterol. 2016; 111 (5): 755. PMID: 26925883; PMCID: PMC5099081.
12. Pipaliya N, Ingle M, Rathi C, Poddar P, Pandav N, Sawant P. Spectrum of chronic small bowel diarrhea with malabsorption in Indian subcontinent: is the trend really changing? Intest Res. 2016; 14 (1): 75-82. doi: 10.5217/ir.2016.14.1.75. PMID: 26884738; PMCID: PMC4754526.
13. Yu S, Chen HB. Tuberculosis of Lymph Node Combined with Pulmonary Mucormycosis. Chin Med J (Engl). 2015; 128 (20): 2812-2814. doi: 10.4103/0366-6999.167363. PMID: 26481751; PMCID: PMC4736879.
14. Zhao N, Yang J, Zhang G."Differential diagnosis between AML infiltration, lymphoma and tuberculosis in a patient presenting with fever and mediastinal lymphadenopathy: A case report". Oncology Letters. 2014; 7 (3): 705-708. doi: https://doi.org/10.3892/ol.2014.1785
15. Bonneau A. Cough in the palliative care setting. Can Fam Physician. 2009; 55 (6): 600-602. PMID: 19509201; PMCID: PMC2694080.
16. Pannu BS, Iyer VN. Lung adenocarcinoma presenting with isolated 'chronic cough'of 3 years duration-a cautionary tale. Respir Med Case Rep. 2015; 16: 157-159. https://doi.org/10.1016/j.rmcr.2015.10.005
17. Shayo FK, Lutale J. Albuminuria in patients with chronic obstructive pulmonary disease: a cross-sectional study in an African patient cohort. BMC Pulm Med 2018; 125:2018. https://doi.org/10.1186/s12890-018-0694-5
18. Vinen CS, Oliveira DBG. Acute glomerulonephritis. Postgrad Med J 2003; 79: 206-213. Available from: https://pmj.bmj.com/content/postgradmedj/79/930/206.full.pdf
19. Kashani A, Landaverde C, Medici V, Rossaro L. Fluid retention in cirrhosis: pathophysiology and management. QJM - Int J Med 2008; 101 (2): 71–85. doi: https://doi.org/10.1093/qjmed/hcm121
20. McEntagart M, Dunstan M, Bell C, et al. Clinical and genetic heterogeneity in peroneal muscular atrophy associated with vocal cord weakness. J Neurol Neurosurg Psychiatry 2002; 73: 762-765. Available from: https://jnnp.bmj.com/content/jnnp/73/6/762.full.pdf
21. Dimachkie MM, Barohn RJ. Distal myopathies. Neurol Clin. 2014; 32 (3): 817-842, x. doi: 10.1016/j.ncl.2014.04.004. PMID: 25037092; PMCID: PMC4109660.
22. Butorac Ahel I, Šubat Dežulović M, Palčevski G. Generalized edema with hypoproteinemia as initial presentation of celiac disease in a 3-year-old boy: case report. Paediatr Croat. 2015; 59 (3): 181-183. doi: http://dx.doi.org/10.13112/PC.2015.27
23. Altiner A, Wilm S, Däubener W, Bormann C, Pentzek M, Abholz HH, Scherer M. Sputum colour for diagnosis of a bacterial infection in patients with acute cough. Scand J Prim Health Care. 2009; 27 (2): 70-73. doi: 10.1080/02813430902759663. PMID: 19242860; PMCID: PMC3410464.
24. Martínez-Girón R, Mosquera-Martínez J, Martínez-Torre S. Black-pigmented sputum. J Cytol. 2013; 30 (4): 274-275. doi: 10.4103/0970-9371.126667. PMID: 24648674; PMCID: PMC3945631.
25. Wani RLS. Clinical manifestations of pulmonary and extra-pulmonary tuberculosis. South Sudan Med J. 2013; 6 (3): 52–56. Available from: http://www.southsudanmedicaljournal.com/assets/files/Journals/vol_6_iss_3_aug_13/TB_Manifestations_SSMJ_Vol_6_3.pdf
26. Ramirez-Lapausa M, Menendez-Saldana A, Noguerado-Asensio A. Extrapulmonary tuberculosis: an overview. Rev Esp Sanid Penit. 2015; 17 (1): 3-11. Available from: http://scielo.isciii.es/pdf/sanipe/v17n1/en_02_revision.pdf
27. Grabe M., Bjerklund-Johansen T., Botto H. et al. Guidelines on Urological Infections. European Association of Urology 2010: 1–112. Available from: https://uroweb.org/wp-content/uploads/19-Urological-infections_LR2.pdf
28. Hui D, Dev R, Bruera E. The last days of life: symptom burden and impact on nutrition and hydration in cancer patients. Curr Opin Support Palliat Care. 2015; 9 (4): 346–354. doi:10.1097/SPC.0000000000000171.
29. Sattar SBA, Singh S. Bacterial Gastroenteritis. [Updated 2019 Mar 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK513295/
30. Levitt DG, Levitt MD. Protein losing enteropathy: comprehensive review of the mechanistic association with clinical and subclinical disease states. Clin Exp Gastroenterol. 2017; 10: 147-168. doi: 10.2147/CEG.S136803. PMID: 28761367; PMCID: PMC5522668.
31. Kattula SRST, Baradhi KM. Anasarca. [Updated 2019 Nov 5]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK519013/
32. Okafor UH (2012). Pattern of Clinical Presentations in Immunocompromised Patient, Immunodeficiency. Krassimir Metodiev, IntechOpen; doi: 10.5772/51519. Available from: https://www.intechopen.com/books/immunodeficiency/pattern-of-clinical-presentations-in-immunocompromised-patient
33. Coats AJ. Origin of symptoms in patients with cachexia with special reference to weakness and shortness of breath. Int J Cardiol. 2002; 85 (1): 133-139. doi: 10.1016/s0167-5273(02)00242-5
34. Gutierrez G, Reines HD, Wulf-Gutierrez ME. Clinical review: hemorrhagic shock. Crit Care. 2004; 8 (5): 373-381. doi: 10.1186/cc2851. PMID: 15469601; PMCID: PMC1065003
35. Hassel B. Tetanus: pathophysiology, treatment, and the possibility of using botulinum toxin against tetanus-induced rigidity and spasms. Toxins (Basel). 2013; 5 (1): 73-83. doi: 10.3390/toxins5010073. PMID: 23299659; PMCID: PMC3564069.
36. Das S. A concise textbook of surgery (3rd ed). Chapter 12 - Tetanus. Calcutta: Dr S Das. 2001. p. 133-136.
37. Martens P, Tits J. Approach to the patient with spontaneous hypoglycemia. Eur J Intern Med. 2014; 25 (5): 415-421. DOI: 10.1016/j.ejim.2014.02.011
38. Lagi A. Syncope and Hypoglycemia. Int. J. Clin. Med. 2011; 2: 129-132. doi:10.4236/ijcm.2011.22023
39. Valderas JM, Starfield B, Sibbald B, Salisbury C, Roland M. Defining comorbidity: implications for understanding health and health services. Ann Fam Med. 2009; 7 (4): 357-363. doi: 10.1370/afm.983. PMID: 19597174; PMCID: PMC2713155.
40. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Nidana sthana - 8th chapter: Apasmara nidanam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 228.
41. Minaglia C, Giannotti C, Boccardi V, Mecocci P, Serafini G, Odetti P, Monacelli F. Cachexia and advanced dementia. J Cachexia Sarcopenia Muscle. 2019; 10 (2): 263-277. doi: 10.1002/jcsm.12380. PMID: 30794350; PMCID: PMC6463474.
42. Prakash O, Jha S. Differential diagnosis for cognitive decline in elderly. J Geriatr Ment Health. 2016; 4 (3): 21-28. Available from: doi: 10.4103/2348-9995.18191

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PANNARUPEEYAM OF *CHARAKA INDRIYA STHANA* - AN EXPLORATIVE STUDY

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REVIEW ARTICLE

PANNARUPEEYAM OF *CHARAKA INDRIYA STHANA*- AN EXPLORATIVE STUDY

Abstract:
Ayurveda has been serving the mankind since ages with holistic approach. *Ayurveda* has advised to treat only curable conditions. *Ayurveda* suggests the physicians to strictly avoid treating the incurable conditions. To estimate the prognosis of diseases *Ayurveda* has described '*Arishta lakshanas*' (fatal signs and symptoms which denotes imminent death). '*Indriya sthana*' (one among the 8 sections of *Charaka samhtia*) of *Charaka samhita* deals with prognostication of life expectancy or estimating survival time frames and alerts the physician towards early identification of fatal conditions based on '*Arishta lakshanas'*. *Indriya sthana* consists 12 chapters and '*Pannarupeeyam indriyam*' is the 7th chapter of *Indriya sthana*. '*Pannarupeeyam indriyam*' chapter contains various *arishta lakshanas* (fatal signs and symptoms which indicates imminent death) pertaining to '*Chhaya'* (complexion), '*Pratichhaya'* (shadow) and '*Prabha'* (radiance or lustre or aura). The present study is aimed to explore the various concepts mentioned in this chapter and also their prognostic significance in present era. Estimating prognosis by examining the pupillary reflections, shadows and mirror images are the unique contributions of *Ayurveda*. Though these techniques are cost effective, non-invasive and simple, they should be tested on sensitivity, specificity and accuracy etc various statistical parameters. Research works are required to standardize and to measure various *Ayurvedic* skin parameters (*Snigdhata*, *Rukshata*, *Kharata*, and *Ghanata* etc) mentioned in this chapter by using various sophisticated instruments. Various life threatening conditions like 'Hepatic encephalopathy', 'Central vertigo', 'Hypercatabolic syndrome', 'Status epilepticus', 'Hypovolemic shock', 'Hemorrhagic shock', 'Delirium', 'Ocuogyric crisis', 'Cachexia', 'Carcinomas', 'Mumps', 'Bell's palsy', 'Buried penis' and 'Sarcopenia' etc are mentioned in this chapter. Further research works are required to substantiate the clinical findings quoted in this chapter.

Key Words: Bell's palsy, Hepatic encephalopathy, Hypercatabolic syndrome, Mumps, Oculogyric crisis, Shock

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INTRODUCTION:

Ayurveda has been serving the mankind since ages with holistic approach. *Ayurveda* has advised to treat only curable conditions. *Ayurveda* suggests the physicians to strictly avoid treating the incurable conditions. To estimate the prognosis of diseases Ayurveda has described *'Arishta lakshanas'* (fatal signs and symptoms which denotes imminent death). *Chakrapani* (commentator on *Charaka samhita)* has stated that diseases are to be treated only if they are curable. The word '*Indra'* denotes life *(prana)*. '*Indriya sthana*' (one among the 8 sections of *Charaka samhtia*) of *Charaka samhita* deals with prognostication of life expectancy or estimating survival time frames and alerts the physician towards early identification of fatal conditions based on '*Arishta lakshanas'*. [1]

'*Pannarupeeyam indriyam*' is the name of the 7th chapter of '*Indriya sthana*' of '*Charaka samhita*'. The word '*Panna rupa*' denotes '*Nashta rupa*', i.e. loss or distortion of shadow image observed in the pupil (*Kumarika*). The present chapter deals with various unique concepts like '*Chhaya'* (complexion), '*Pratichhaya'* (shadow) and '*Prabha'* (radiance or lustre or aura) and their prognostic significance. *Arishta lakshanas* of clinical conditions like hepatic encephalopathy, central vertigo, hypercatabolic syndrome, status epilepticus, hypovolemic shock, hemorrhagic shock, delirium, ocuogyric crisis, cachexia, carcinomas, mumps, Bell's palsy, buried penis and sarcopenia etc are also mentioned in this chapter. The present study is aimed to explore the various concepts mentioned in this chapter and also their prognostic significance in present era. [2]

MAIN CONTENTS:

दृष्ट्यां यस्य विजानीयात् पन्नरूपां कुमारिकाम्।
प्रतिच्छायामयीमक्ष्णोर्नैनमिच्छेच्चिकित्सितुम्॥

Drushtyam --- chikitsitum [*Verse* 3] [2]

Light arriving at its surface mainly refracts and enters the eye, a small part reflects back into the environment which can be noticed when looking at a person's eye. Analyzing and exploiting such corneal reflections (रूपां कुमारिकाम्) from eye images can be beneficial to accomplish a wide range of tasks that involve information about the environment (scene panorama/model) and the relationship with the observer (eye pose). Corneal reflections allow us to determine the situation under which a person is photographed (forensics, surveillance), to calculate a person's field of view and point of gaze. [3] Corneal imaging system provides information regarding field of view, resolution and locus of viewpoints. In Ophthalmology, pupil reflections are assessed by 'Red

reflex test' which is an effective screening tool to diagnose various neonatal eye abnormalities. A darkened reflex (absent red reflex) (प्रतिच्छायामयीमक्ष्णोर्नैनमिच्छेत्) indicates that something is blocking the passage of light such as a cataract, a hazy cornea, a hemorrhage, or a scar. A white reflex (प्रतिच्छायामयीमक्ष्णोर्नैनमिच्छेत्) indicates the presence of something white inside the eye such as a malignant tumour, a retinal infection, a cataract, or a scar. [4]

Absent (पन्नरूपां कुमारिकाम्) or Leukocoria or a white pupillary reflex can be caused by opacification of either cornea or the lens or the vitreous, or the retina. Leukocoria is seen in various conditions like retinoblastoma (RB) (extremely high risk of secondary malignancies), infantile cataracts seen in inheritance, chromosomal anomalies, systemic syndromes, systemic diseases, TORCH - toxoplasmosis, other diseases, rubella, cytomegalovirus, and herpes simplex virus infections, trauma, Coat's disease, corneal scarring, toxocariasis, and optic disc coloboma. Most cases of 'Retinoblastoma' present when the family notices a "cat's eye reflex" or leukocoria (प्रतिच्छायामयीमक्ष्णोर्नैनमिच्छेत्) in family photographs. Leukocoria is present because the tumor appears as a white mass within the retina and can grow to fill the entire vitreous cavity, resulting in a very poor prognosis as it spreads through the optic nerve to the brain. [5] The above verse indicates loss or distortion of the image reflected in the pupil of patient's eye. Same phenomenon is used as 'Red reflex assessment or testing' in ophthalmological clinics to test corneal or pupil reflections for diagnosing various eye problems.

ज्योत्स्नायामातपे दीपे सलिलादर्शयोरपि। अङ्गेषु विकृता यस्य च्छाया प्रेतस्तथैव सः॥
छिन्नाभिन्नाऽऽकुला च्छाया हीना वाऽप्यधिकाऽपि वा। नष्टा तन्वी द्विधा च्छिन्ना विकृता विशिरा च या॥
एताश्चान्याश्च याः काश्चित् प्रतिच्छाया विगर्हिताः। सर्वा मुमूर्षतां ज्ञेया न चेल्लक्ष्यनिमित्तजा॥

Jyotsnaayaam --- nimittajaa [*Verse* 4-6] [2]

The processing of shadows has been the target of an increasing number of studies in recent years. Our visual system is somehow forced to find an association between the visible shadow and the object that most likely casts it, thus solving the "shadow correspondence problem". Few studies have demonstrated that shadows provide additional information regarding body biometrics that enhance person identification and gait recognition both inside a building (using artificial light) (दीपे) and outside (under the natural sunlight) (ज्योत्स्नायामातपे). A different line of research worth mentioning is the one that explored the interpretation of mirror reflection (सलिलादर्शयोरपि) of body parts. To correctly interpret mirror-reflections, our brain needs to understand that the object that appears in the mirror (e.g., our face) occupies in fact a different location in space. Research on body shadows is still in its infancy. Seeing one's own body, through direct vision or mirrors, can affect somatosensation in general. For instance, looking at an image of ourselves in the mirror has been shown to improve the perception of heart-beat signals, and specifically heart-beat counts which are considered a proxy of the person's ability to pay attention to interoceptive signals. There is also evidence that vision of one's own body parts (अङ्गेषु विकृता) can modulate pain perception. Another line of investigation within this aim of finding parallels between perception of body-shadow and perception of other visible instances of the body is related to the validation of the existing findings obtained for shadows of body parts (अङ्गेषु), to shadows of the whole body. [6]

In the absence of radiodiagnosis and imaging technology (ultrasound, X-ray, magnetic resonance imaging etc) in ancient India, Ayurvedic practitioners have developed their own methods to diagnose or detect deep seated, invisible, subtle pathologies by studying the body shadows or reflections of the patients. Study of body shadows or reflections may provide information to the minute details or improves attention towards interoceptive signals which leads to the diagnosis of hidden, deep seated, internal pathology which may not be easily visible otherwise. Any abnormalities found in the shadows or reflections of body or body parts (छिन्ना, भिन्ना, आकुला, च्छाया हीना or अधिका, नष्टा, तन्वी, द्विधा च्छिन्ना, विकृता, and विशिरा etc) denote an underlying pathology (which can't be detectable or identifiable by direct examination) and an imminent death (सर्वा मुमूर्षतां ज्ञेया).

Concept of *Chhaya, Pratichhaya* & *Prabha*:

संस्थानेन प्रमाणेन वर्णेन प्रभया तथा। छाया विवर्तते यस्य स्वस्थोऽपि प्रेत एव सः॥
संस्थानमाकृतिर्ज्ञेया सुषमा विषमा च सा। मध्यमल्पं महच्चोक्तं प्रमाणं त्रिविधं नृणाम्॥
प्रतिप्रमाणसंस्थाना जलादर्शातपादिषु। छाया या सा प्रतिच्छाया च्छाया वर्णप्रभाश्रया॥

Samsthaanena --- prabhaashraya [*Verse* 7-9] [2]

The word '*Chhaya'* denotes skin complexion (is the natural colour, texture and appearance of a person's skin especially face), '*Pratichhaya'* denotes shadow or reflections and '*Prabha'* denotes radiance or glow or aura or luminance. The image reflected in water, mirror or under sunlight etc is termed as '*Pratichhaya'* (shadow or reflection of body or body parts) which corresponds to the measurement (प्रमाण) and shape (संस्थान) of the body or body parts which casts them. '*Samsthana'* is of two types (*sushama* - symmetrical or even; *vishama* - asymmetrical or uneven) and '*Pramana'* is of three types (*Alpa* - small or short; *Madhyama* - Medium; *Mahat* - Big or large). Any abnormalities of छाया, प्रतिच्छाया, and प्रभा (sudden change

without any visible or identifiable cause) denotes an underlying pathology and imminent death.

खादीनां पञ्चपञ्चानां छाया विविधलक्षणाः। नाभसी निर्मला नीला सस्नेहा सप्रभेव च॥
रूक्षा श्यावारुणा या तु वायवी सा हतप्रभा। विशुध्दरक्ता त्वाग्नेयी दीप्ताभा दर्शनप्रिया॥
शुध्दवैदूर्यविमला सुस्निग्धा चाम्भसी मता। स्थिरा स्निग्धा घना श्लक्ष्णा श्यामा श्वेता च पार्थिवी॥
वायवी गर्हिता त्वासां चतस्रः स्युः सुखोदयाः। वायवी तु विनाशाय क्लेशाय महतेऽपि वा॥

Khaadinaam --- mahato api va [*Verse* 10-13] [2]

Five types of *Chhaya* (नाभसी, वायवी, आग्नेयी, अम्भसी and पार्थिवी) and their characteristic features are explained in the above verse. Various qualitative and quantitative parameters (both subjective and objective) are used to standardize the five types of skin complexions in the above verses. Skin colour (नाभसी - नीला; वायवी - श्यावारुणा; आग्नेयी - रक्ता; अम्भसी - वैदूर्य; and पार्थिवी - श्यामा श्वेता), luminosity (नाभसी - सप्रभा; वायवी - हतप्रभा; and आग्नेयी - दीप्ताभा), brightness (नाभसी - निर्मला; अम्भसी - विमला; and पार्थिवी - श्लक्ष्णा), transparency (आग्नेयी - विशुध्दा and अम्भसी - शुध्दा), hydration & elasticity (नाभसी - सस्नेहा; वायवी - रूक्षा; पार्थिवी - स्निग्धा and अम्भसी - सुस्निग्धा), firmness (स्थिरा घना च पार्थिवी), homogeneity (श्लक्ष्णा च पार्थिवी), and imperfections (वायवी - रूक्षा) etc parameters have been used to describe or to standardize the five skin complexions (नाभसी, वायवी, आग्नेयी, अम्भसी and पार्थिवी) in *Ayurveda* (Table 1).

The skin complexion evaluation can be done by using C.L.B.T. method which is based upon a visual sensory analysis of the four following descriptors (छाया विविधलक्षणाः) colour, luminosity, brightness and transparency of the skin of the face. Decrease in the "Yellow" colour can be interpreted as an effect "looks good" (complexion was less yellowish) (शुध्दवैदूर्यविमला अम्भसी). Decrease in the "Olive" colour can also be interpreted as an effect "looks good" (less of a greenish–olive complexion) (शुध्दवैदूर्यविमला अम्भसी). Increase in the "Pink" colour is interpreted as "the skin looks healthier" (विशुध्दरक्ता त्वाग्नेयी). Increase in the "Brightness" means that the homogeneity of the skin was improved. Increase in the "Transparency" means that the skin seems to be thinner (विशुध्दरक्ता त्वाग्नेयी) whereas an increase in the "Luminosity" is related to a more pronounced reflection of the light by the skin (आग्नेयी दीप्ताभा). [7]

Blood oxygenation state is related to health status and affects skin colour. In women, increased sex hormone levels are associated with increased skin vascularisation and vasodilatory response, which arterializes the blood in the skin. In humans, there is evidence that colouration is interpreted by observers as a cue to underlying physiological health or quality. The distribution of pigment colour (blood and melanin) in the skin can affect the apparent health, age and attractiveness of human faces. Women who wear red are seen as more attractive by men (आग्नेयी दर्शनप्रिया). A decrease in blood perfusion below normal levels (pallor) is associated with ill health (श्यावारुणा या तु वायवी). [8]

Skin colour is a blend resulting from the skin chromophores red (oxyhaemoglobin) (रक्ता त्वाग्नेयी), blue (deoxygenated haemoglobin) (नाभसी नीला & श्यावारुणा या तु वायवी), yellow-orange (carotene, an exogenous pigment) (वैदूर्या च अम्भसी), and brown (melanin) (श्यामा च पार्थिवी). Two groups of pigmentary disorders are commonly distinguished: the disorders of the quantitative and qualitative distribution of normal pigment and the abnormal presence of exogenous or endogenous pigments in the skin. Pigmentary disorders include, hyperpigmentation (darkening of the skin colour) (घना श्यामा च पार्थिवी) and Leukodermia (lightening of the skin), Hypermelanosis is an overload of melanin or an abnormal distribution of melanin in the skin. Depending on the colour, melanodermia (brown/black) and ceruloderma (blue/grey) (नाभसी नीला & श्यावा तु वायवी) are distinguished. Dyschromia is the abnormal presence in the skin of a pigment of exogenous or endogenous origin. [9]

In the aging process of skin, oxidative damage in cells and tissues caused by a disturbance in the balance between the production of reactive oxygen species (ROS) and the natural antioxidant defences. In the skin, free radical damage can cause deterioration of the stratum corneum and supportive connective tissue, resulting in decreased elasticity and resilience. Sun damage, increasing ROS production, can cause both skin cancer and photo-aging and affects the skin through wrinkling, scaling, dryness, and mottled pigmentation (वायवी गर्हिता त्वासां विनाशाय क्लेशाय महतेऽपि वा). [10] वायवी छाया denotes premature ageing process of skin and it is considered as pathological.

स्यात्तैजसी प्रभा सर्वा सातु सप्तविधा स्मृता। रक्ता पीता सिता श्यावा हरिता पाण्डुराऽसिता॥
तासां याः स्युर्विकासिन्यः स्निग्धाश्च विपुलाश्च याः। ताः शुभा रूक्षमलिनाः संक्षिप्ताश्चाशुभोदयाः॥
वर्णमाक्रामति च्छाया भास्तु वर्णप्रकाशिनी। आसन्ना लक्ष्यते च्छाया भाः प्रकृष्टा प्रकाशते॥
नाच्छायो नाप्रभः कश्चिद्विशेषाश्चिह्नयन्ति तु। नृणां शुभाशुभोत्पत्तिं कालेछायाप्रभाश्रयाः॥

Naachhaayo --- prabhaashraya [*Verse* 14-17] [2]

Seven types of *Prabha* (रक्ता, पीता, सिता, श्यावा, हरिता, पाण्डु and असिता) and their characteristic features are explained in

the above verse. *Prabha* denotes radiance or luminance which is due to greater reflection of light from the skin, blood oxygenation, increased vascularisation, and also physiological health. *Prabha* can also be considered as 'AURA'. The human aura may be described as a fine, ethereal radiation or emanation similar to that of electromagnetic field (EM) surrounding each and every living being which can be observed only by trained eyes. Aura not only made from colour and energy, but also has shape or dimensions. Kirlian photography is used to capture the AURA. This technique is also known as "electrophotography", "corona discharge photography" (CDP), "bioelectrography", "gas discharge visualization (GDV)","eletrophotonic imaging (EPI)", and "Kirlianography". [11] Illness may be represented by characteristic defects in the finger images of Kirlian photographs which correspond to the main organs of the body. Kirlian camera can measure human energy levels and examine changes in the subtle energy distribution of the individual. This Kirlian photograph gives information on the subject of the psychological, emotional and physical stipulation. Kirlian photographic images have the capability to detect diseases. [12]

The Aura energy system has the seven colours similar to the band of colours in the rainbow, that is, VIBGYOR (Violet, Indigo, Blue, Green, Yellow, Orange and Red) and each colour is associated with seven *Chakras* (सहस्रार, आज्ञा, विशुध्द, अनाहत, मणिपूर, स्वाधिष्टान and मूलाधार) respectively. The Aura colour is dependent on the positive and negative energies of the individual. Mental health and emotions can influence the colour, brightness and patterns of light in Aura. If the *Chakra* system is in harmony, the Aura will be wider and has pleasant effects (याः स्युर्विकासिन्यः स्निग्धाश्च विपुलाश्च याः) on the person. If not, denotes pathology, which will lead to a series of problems (शुभाशुभोत्पत्तिं काले छायाप्रभाश्रयाः). [13] Seven types of *Prabha* (रक्ता, पीता, सिता, श्यावा, हरिता, पाण्डु and असिता) mentioned in the above verse may have connection with seven *Chakras* (सहस्रार, आज्ञा, विशुध्द, अनाहत, मणिपूर, स्वाधिष्टान and मूलाधार) and the colours of AURA. The differences between *Chhaya* and *Prabha* are also explained in the above verse (Table 2).

Various *arishta lakshanas* mentioned in this chapter (Table 3):

कामलाऽक्ष्णोर्मुखं पूर्णं शंखयोर्मुक्तमांसता । संत्रासश्चोष्णगात्रत्वं यस्य तं परिवर्जयेत् ॥

Kaamala --- parivarjayet [*Verse* 18] [2]

Approximately 20% to 40% of people with chronic hepatitis C go on to develop liver cirrhosis over a period of 10 to 40 years. Jaundice (कामला), fluid retention (swelling o f face) (मुखं पूर्णम्), cognitive and mood changes (depression, irritability and anxiety etc) (संत्रासम्), fever (उष्णगात्रत्वम्) with chills and night sweats are seen in Hepatitis C with or without cirrhosis of liver and also in Hepatic encephalopathy. [12] The impact of microbial pathogens on the liver can vary greatly, presenting with a wide variety of manifestations from asymptomatic elevations in aminotransaminases, acute liver failure, hepatic fibrosis, and cirrhosis. Infectious diseases of the liver is caused by various pathogens like viruses (Epstein Barr virus - EBV, Cytomegalo virus - CMV, Herpes simplex virus - HSV and other herpes viruses, Yellow fever virus and Dengue virus), Bacteria and mycobacteria (Salmonella enterica typhi, Mycobacterium tuberculosis, Brucella species, Coxiella bunerii, Leptospira and other spirochetes), Parasites (Schistosoma species and Plasmodium species), and Fungi (Candida species and Histoplasma capsulatum). [15]

Liver cirrhosis is a common gastroenterological pathology among adults. Its aetiological factors are: alcohol abuse, hepatitis B infection, hepatitis C infection, non-alcoholic fatty liver disease, non-alcoholic steatohepatitis and others. Cirrhosis with multiple-aetiologies are more susceptible of developing multiple organ failures, predominantly kidney, brain, heart and others. Patients with hepatic encephalopathy with cirrhosis of liver may present with edema (मुखं पूर्णम्), fever (उष्णगात्रत्वम्), jaundice (कामला), and anxiety (संत्रासम्) etc. [16] The above verse may also denote various other conditions like Heptaoblastoma, malignant tumours of liver, sarcoidosis, delirium with liver failure, hepatocellular carcinoma, and glandular fever etc.

उत्थाप्यमानः शयनात् प्रमोहं याति यो नरः । मुहुर्मुहुर्न सप्ताहं स जीवति विकत्थनः ॥

Uthaapyamaana --- vikathana [*Verse* 19] [2]

Pre-syncope is a sensation of impending faintness or loss of consciousness (प्रमोहं याति). Often the symptom occurs when the patient rises from a lying or sitting position (उत्थाप्यमानः शयनात्). No symptom is experienced when the patient is supine (उत्थाप्यमानः शयनात्). Causes include orthostatic hypotension, autonomic dysfunction due to diabetes, and cardiovascular diseases like arrhythmias, myocardial infarction, and carotid artery stenosis. Central vertigo may be associated with other neurological symptoms like cerebellar signs, ataxia, dysarthria, diplopia, visual disturbance, or limb weakness. Some of the causes of central vertigo include migraine, vertebrobasilar insufficiency, stroke, transient ischaemic attack, tumour, and multiple sclerosis. Some of the central causes of vertigo are potentially fatal (सप्ताहं स जीवति) and the patient should be referred for neurological assessment if central vertigo is suspected. [17]

संसृष्टा व्याधयो यस्य प्रतिलोमानुलोमगाः । व्यापन्ना ग्रहणीप्रायः सोऽर्धमासं न जीवति ॥

Samsrushtaa --- na jeevati [*Verse* 20] [2]

Comorbidity of प्रतिलोम व्याधि (ऊर्ध्वगत रक्तपित्त, छर्दि etc) and अनुलोम व्याधि (अधोगत रक्तपित्त, अतिसार etc) and 'ग्रहणी' with complications are considered as *Arishta*. The above verse denotes various disease conditions having manifestation either upper or lower part of the body (primary focus) later spreading towards other parts or all over the body (for example, oesophageal cancer getting originated from the lower esophagus, later disseminating or forming distal metastases toward five main anatomical sites: the head and neck, thoracic, abdomen and pelvis, extremities, and multiple skin and muscle metastases). [18] Diseases like MND (motor neuron disease), ALS (Amyotrophic lateral sclerosis), MS (multiple sclerosis), muscular dystrophies, GBS (Guillain-Barre syndrome), SLE (systemic lupus erythematosus), bleeding disorders (ऊर्ध्वगत & अधोगत रक्तपित्त), PAD (peripheral artery disease), localized infection at later stages causing septicaemia, and peripheral neuropathies etc. Various other conditions like chronic pancreatitis, alcoholic liver disease, cystic fibrosis, tropical sprue, malabsorption syndrome, celiac disease, crohn's disease, ulcerative colitis, carcinoma of gastrointestinal tract, SIBO (small intestinal bacterial overgrowth), and complications associated with all these conditions (व्यापन्ना ग्रहणीप्रायः) indicates imminent death within fifteen days.

उपरुध्दस्य रोगेण कर्शितस्यात्पमश्नतः। बहुमूत्रपुरीषं स्याद्यस्य तं परिवर्जयेत्॥
दुर्बलो बहु भुङ्क्ते यः प्राग्भुक्तादन्नमातुरः। अल्पमूत्रपुरीषश्च यथा प्रेतस्तथैव सः॥
Uparuddhasya --- pretastathaiva sa [*Verse* 21-22] [2]

'रोगेण कर्शितस्य' & 'दुर्बल' denotes cachexia (pulmonary or cardiac or cancer); 'अल्पमश्नतः' denotes reduced appetite in cachexia or critical illness patients; 'बहुमूत्रपुरीषम्' indicates diarrhoea & polyuria in those critically ill, cachexic patients.

बहुमूत्रम् (*Bahu Mutram*):

Polyuria frequently occurs in critically ill patients. Common syndromes in which polyuria occurs include acute nonoliguric renal failure, polyuria of sepsis and inappropriate secretion of anti-diuretic hormone. [19]

बहुपुरीषम(*Bahu Pureesham*):

Diarrhoea is commonly found in patients with advanced cancer. Diarrhoea may be caused by comorbidities such as inflammatory bowel disease (IBD) and thyroxicosis. Cancers can cause malabsorption syndromes (दुर्बलो बहु भुङ्क्ते यः) by a number of mechanisms. Each of these is characterized by increased fecal fat. A number of pancreatic islet cell tumours may be associated with severe secretory diarrhoea. Vasoactive intestinal protein-secreting tumours may cause severe life-threatening watery diarrhoea. Similar problems may be seen in some patients with carcinoid syndrome, medullary carcinoma of thyroid and GIST (gastrointestinal stromal tumours). Less severe diarrhoea may be observed with gastrinomas causing a Zollinger Ellison Syndrome (दुर्बलो बहु भुङ्क्ते यः). [20]

अल्पमूत्रम् (*Alpa Mutram*)::

'अल्पमूत्रम्' denotes either oliguria or urinary retention in critically ill patients. Oliguria is observed in many critically ill patients and was one of the very first "biomarkers" of acute kidney injury (AKI) and it is also associated with chronic liver disease (CLD). [21&22] Urinary retention is the inability to voluntarily void urine and it can be acute or chronic. Causes of urinary retention are numerous and can be classified as obstructive (Benign prostatic hyperplasia - BPH, meatal stenosis, penile constricting bands, prostate cancer, cystocele, rectocele, gynaecologic malignancy, pelvic mass, retroverted impacted gravid uterus, aneurismal dilatation, bladder calculi or neoplasm, gastrointestinal or retroperitoneal malignancy or mass, urethral strictures etc), infectious and inflammatory (prostatic abscess, prostatitis, balanitis, acute vulvovaginitis, vaginal pemphigus or lichen sclerosis, bilharziasis, cystitis, echinococcosis, Guillain-Barre syndrome - GBS, Herpes simplex virus - HSV, Lyme disease - LD, transverse myelitis - TM, varicella zoster virus, tubercular cystitis or urethritis etc), pharmacologic, neurologic (autonomic neuropathy, diabetes mellitus, GBS, herpes zoster virus, LD, pernicious anaemia, cerebrovascular disease, Multiple sclerosis, neoplasms or tumours of brain, Parkinson's disease, Shy-Drager syndrome, dysraphic lesions, spinal cord hematoma or abscess or stenosis, spinovascular disease, TM, tumours or masses of conus medullaris etc), or other (urethral sphincter dysfunction - Fowler's syndrome, disruption of posterior urethra and bladder neck in pelvic trauma). [23]

अल्पपुरीषम् (*Alpa Pureesham*):

'अल्पपुरीषम्' denotes either low quantity of faeces or fecal impaction (FI) in critically ill patients. Low fecal weight and slow bowel transit time are thought to be associated with bowel cancer risk. Low stool weight is associated with a number of conditions, including constipation, irritable bowel syndrome, gallstones, disordered anorectal function, and abnormal cells in breast ducts. There is a significant inverse relationship between stool weight and colon cancer incidence. [24] FI is a common cause of lower gastrointestinal tract obstruction lagging behind stricture for diverticulitis and colon cancer. It is the result of chronic or severe constipation and most commonly found in the elderly population. FI is associated with risks of complications such as bowel obstruction leading to aspiration, stercoral ulcers, perforation, and peritonitis. [25] FI or partial bowel obstruction can manifest as alternating constipation and diarrhoea. FI results in bacterial degradation of stools above the level of impaction,

resulting in fluid stool leaking past the impacted mass, sometimes with incontinence. [20]

इष्टं च गुणसम्पन्नमन्नमश्नाति यो नरः। शश्वश्च बलवर्णाभ्यां हीयते न स जीवति॥

Ishtam cha --- na sa jeevati [*Verse* 23] [2]

Hypercatabolic syndrome (HS) is a biochemical state characterized by increased circulating catabolic hormones (eg, cortisol, catecholamines) and inflammatory cytokines (eg, tumour necrosis factors, interleukin–1), and decreased anabolic insulin effects with consequent insulin resistance. The most important metabolic consequence of HS is the skeletal and cardiac muscle protein breakdown and reduced skeletal & cardiac physiologic and metabolic functions (बलवर्णाभ्यां हीयते). HS occurs in many diseases such as diabetes mellitus, chronic heart failure, chronic obstructive pulmonary disease (COPD), renal and liver failure, trauma, sepsis, and senescence. [26] Critical illness is any disease state, medical or surgical which requires treatment in the intensive care unit (ICU). Critical illness is frequently associated with infection or sepsis, severe trauma, postsurgical state, pancreatitis, burn injury, haemorrhage, and ischemia. Catabolic critical illness is a life-threatening condition created by overwhelming infection, trauma, or other kinds of severe tissue injury. Critical illness is a hypercatabolic state and, in the absence of adequate nutrition interventions, can predispose to malnutrition (बलवर्णाभ्यां हीयते), leading to poor clinical outcomes (न स जीवति). [27] By considering all these facts it seems that the conditions explained in the above three verses denotes various conditions like carcinomas, malabsorption, multi organ dysfunction (renal and liver failure), and gastrointestinal dysfunction etc seen in critically ill patients.

प्रकूजति प्रश्वसति शिथिलं चातिसार्यते। बलहीनः पिपासार्तो शुष्कास्यो न स जीवति॥

Prakujati --- na sa jeevati [*Verse* 24] [2]

Patients with hypovolemic shock have severe hypovolemia with decreased peripheral perfusion. Hypovolemic shock occurs as a result of either blood loss or extracellular fluid loss. GI losses (अतिसार्यते) can occur via many different causative factors. Volume depletion occurs when there is retractable vomiting, diarrhoea (अतिसार्यते), or external drainage via stoma or fistulas. Symptoms of hypovolemic shock can be related to volume depletion, electrolyte imbalances, or acid-base disorders that accompany hypovolemic shock. Patients with volume depletion may complain of thirst (पिपासार्तो), muscle cramps, and/or orthostatic hypotension. Agitation, lethargy, or confusion may result from brain malperfusion. Physical findings suggestive of volume depletion include dry mucous membranes (शुष्कास्यो), decreased skin turgor, and low jugular venous distension. [28] Increased respiratory drive (due to peripheral stimulation of pulmonary receptors, carotid body chemoreceptors and hypoperfusion to the medullary respiratory center) in hypovolemic shock leads to increased minute volume (tachypnea and hyperpnea) (प्रकूजति प्रश्वसति), hypocapnia, and primary respiratory alkalosis. Coupled with an increased workload, respiratory, and diaphragmatic muscle impairment caused by hypoperfusion may lead to early respiratory failure and may also leads to adult respiratory distress syndrome (प्रकूजति प्रश्वसति). [29] The above verse may also denote diabetic ketoacidosis (Kussumaul respirations), metabolic acidosis and acute kidney injury etc conditions.

ह्रस्वं च यः प्रश्वसति व्याविध्दं स्पन्दते च यः। मृतमेव तमात्रेयो व्याचचक्षे पुनर्वसुः॥

Hrasvam cha --- punarvasu [*Verse* 25] [2]

Status epilepticus (SE) is defined as 'a seizure that persists for a sufficient length of time or is repeated frequently enough that recovery between attacks does not occur.' SE may be classified broadly as convulsive SE (व्याविध्दं स्पन्दते च यः) and nonconvulsive SE. SE can be seen in acute infections, high fever, hypoglycemia, electrolyte imbalance, organ dysfunction, drug intoxication, poisoning, alcohol withdrawal, excess use of alcohol, stroke, trauma, and hypertensive encephalopathy. Failure of cerebral autoregulation, hypoglycaemia, hypoxia (ह्रस्वं च यः प्रश्वसति), acidosis, hyponatremia, hypo/hyperkalemia, falling blood pressure and falling cardiac output etc are the features of SE. Prolonged seizures can lead to multiple organ dysfunctions (मृतमेव). Non-neurological complications of SE include pneumonia, atelectasis, adult respiratory distress syndrome, neurogenic pulmonary edema, pulmonary embolism, hypovolemia, myocardial dysfunction, hypertension, arrhythmias, stress ulcer, gastrointestinal bleed, constipation, diarrhoea, paralytic ileus, renal dysfunction, and urinary tract infection. [30]

A variety of terms have been used to describe delirium, including "acute confusional state," "acute brain syndrome," "acute cerebral insufficiency," and "toxic-metabolic encephalopathy". Disturbed psychomotor behavior is another clinical feature of delirium, with unusually increased (व्याविध्दं स्पन्दते च यः) or decreased motor activity. In the first case, patients may have restlessness or frequent sudden changes of position. In the hyperactive subtype (व्याविध्दं स्पन्दते च यः), there is increased psychomotor activity. Patients show features such as hyper-vigilance, restlessness, agitation, aggression, mood lability, hallucinations and delusions. Behaviours are frequently disruptive or potentially harmful. Overall, delirium has been associated with the increase of hospital stay, cognitive decline, functional decline, institutionalization, and mortality (मृतमेव). [31] The above verse may also denote various other conditions like cerebral hypoxia, cerebral hypoperfusion, CNS infections, toxaemia, paroxysmal

dyskinesia, acute ballismus or chorea, status dystonicus, tetany, myoclonus or myoclonic jerks, and Parkinson's dementia etc.

ऊर्ध्वं च यः प्रश्वसिति श्लेष्मणा चाभिभूयते। हीनवर्णबलाहारो यो नरो न स जीवति॥

Urdhvam cha --- na sa jeevati [*Verse* 26] [2]

An attack of pulmonary oedema is characterized by difficulty, laboured breathing (ऊर्ध्वं च यः प्रश्वसिति) and is usually accelerated. The patient sits up in bed and may lean forward. Patient repeatedly emits a white, yellowish or pink frothy sputum (श्लेष्मणा चाभिभूयते). This may vary from a few bubbles to enormous amounts (श्लेष्मणा चाभिभूयते). Cold, clammy extremities, paroxysms of suffocation and vomiting may occur. Pulmonary oedema is seen in a wide variety of conditions like severe coronary disease, congestive heart failure, carcinoma of lungs, bronchopneumonia, hypertensive heart disease, massive pulmonary embolism, cerebral haemorrhage or tumours, pulmonary tuberculosis, liver cirrhosis, and infections. [32] Dyspnoea is a common experience in lung cancer patients. It is associated with a conscious sensation of uncomfortable breathing, smothering or suffocating, difficult or laboured breathing, inability to get enough air, or tightness in the chest (ऊर्ध्वं च यः प्रश्वसिति). The American Thoracic Society (ATS) suggests the prevalence ranges from 55% – 87% in all stages of lung cancer (हीनवर्णबलाहारो). A direct cause of dyspnoea involves cancer, or its effects, such as tumour or lymphatic invasion, effusion, obstruction of pulmonary tissue, or the complication of pulmonary embolism (न स जीवति). [33] The above verse denotes pulmonary oedema and / or carcinoma of lungs with pulmonary cachexia.

ऊर्ध्वाग्रे नयने यस्य मन्ये चारतकम्पने। बलहीनः पिपासार्तः शुष्कास्यो न स जीवति॥

Urdhvagre --- na sa jeevati [*Verse* 27] [2]

Dehydration (पिपासार्तः शुष्कास्यो) is common among stroke subjects, and hydration status is associated with stroke-in-evolution, in acute ischemic stroke. It has been proved that dehydration status may lead to cerebral hypoperfusion (मन्ये चारतकम्पने) and decreased collateral blood flow, which may exacerbate the ischemic brain injury. Dehydration and its associated changes in blood viscosity can result in decreased cerebral blood flow. [34] Vertical gaze palsy/paresis involved both upward and downward eye movements and associated with nystagmus and lid retraction or ptosis. The sites of stroke were often midbrain and diencephalic structures. We also documented cases of dorsal midbrain syndrome, also known as Parinaud's syndrome, which is specifically a limitation of upgaze of both eyes (ऊर्ध्वाग्रे नयने). This occurs following involvement of vertical upward gaze projections through the posterior commissure in the upper midbrain. [35] Coma with sustained upward gaze deviation (ऊर्ध्वाग्रे नयने) followed by cardiac arrest and prolonged systemic hypotension (मन्ये चारतकम्पने) has been observed in some patients. Forced upgaze (ऊर्ध्वाग्रे नयने) is usually due to the result of severe hypoxic encephalopathy (मन्ये चारतकम्पने). [36] Vertical eye deviation in hypoxic coma is considered to be rare and is seen in post resuscitation comatose patients. The upward and the downward deviations resulted from diffuse cerebro-cerebellar damage sparing the brainstem. [37]

Oculogyric crises (OGC) are a dystonia of ocular muscles characterized by dramatic involuntary conjugate deviation of the eyes. The eyes usually inadvertently move straight upward or up (ऊर्ध्वाग्रे नयने) and to the left or right, and the position can change from crisis to crisis. In addition to post-encephalitic parkinsonism, OGC have been associated with other neurologic disorders such as Parkinson's disease, familial Parkinson's dementia syndrome, basal ganglia calicifications (Fahr disease), neurosyphilis, multiple sclerosis, ataxia-telangiectasia, Rett's syndrome, Wilson's disease, cerebellar disease, trauma, acute brainstem encephalitis, third ventricular cystic glioma, paraneoplastic disease, midbrain lesions, and striatocapscular infarction. [38] The above verse denotes carotid artery stenosis or aneurysm or dissection or kinking or thrombosis or sclerosis (मन्ये चारतकम्पने) etc associated with cerebral hypoperfusion which leads to ischemic brain injury and upward gaze deviation.

यस्य गण्डावुपचितौ ज्वराकासौ च दारुणौ। शूली प्रद्वेष्टि चप्यन्नं तस्मिन् कर्म न सिध्यति॥

Yasya gandau --- na siddhyati [*Verse* 28] [2]

The hallmark of mumps is salivary gland swelling (यस्य गण्डावुपचितौ), typically the parotid glands, which forms the basis of a clinical diagnosis. Parotitis is usually bilateral (यस्य गण्डावुपचितौ), developing 2–3 weeks after exposure and lasting for 2–3 days, but it may persist for a week or more in some cases. Submaxillary, submandibular and sublingual glands can be involved. Fever (ज्वर), cough (कास), malaise, headache, and myalgia are also seen. Complications of mumps include meningitis, encephalitis, epididymo-orchitis, deafness, pancreatitis (severe epigastic pain and tenderness) (शूली), oophoritis, and other rare complications (cerebellar ataxia, transverse myelitis, ascending polyradiculitis, a poliomyelitis-like disease, arthropathy, autoimmune haemolytic anaemia, thyroiditis, thrombocytopenia, hepatitis and retinitis and corneal endotheliitis) (कर्म न सिध्यति). [39] The most common causes of salivary lumps are benign neoplasms, malignancy, salivary stones and stenoses, and salivary swelling (adenosis) secondary to

systemic diseases such as Sjögren's syndrome or HIV infection. Systemic causes for sialadenosis are diabetes mellitus, hypothyroidism, Cushing's syndrome, celiac disease, malnutrition, dysautonomia, Shy-Drager syndrome, and anorexia etc. [40] The above verse may also indicate various other conditions like bilateral parotid tuberculosis, diphtheria, and neoplastic or infectious diseases of salivary glands.

व्यावृत्तमूर्धंजिह्मास्यो भ्रुवौ यस्य च विच्युते। कण्टकैश्चाचिता जिह्वा यथा प्रेतस्तथैव सः॥

Vyavrutta --- preta stathaiva sa [*Verse* 29] [2]

Idiopathic facial nerve palsy usually manifests itself as sudden weakness of the muscles of facial expression on one side of the face. It is often first noticed by the patient upon looking in a mirror, or by members of the patient's family. Drooling from the corner of the mouth can also be the initial symptom. The typical features of peripheral facial nerve palsy are a lack of wrinkling of the forehead (व्यावृत्तमूर्ध), low eyebrow position (eyebrow ptosis) (भ्रुवौ यस्य च विच्युते), incomplete lid closure, hanging corner of the mouth (जिह्मास्यो), and a flattened nasolabial fold (जिह्मास्यो). Causes of peripheral facial nerve palsy are idiopathic, neuroborreliosis, herpes zoster oticus (Ramsay Hunt syndrome), rickettsia, HIV, human herpes virus, mumps virus, cytomegalovirus, and rubella virus, sarcoidosis (Heerfordt syndrome), Sjögren syndrome, carcinomatous meningitis, Melkersson-Rosenthal syndrome, Guillain-Barre syndrome, Miller Fisher syndrome, and parotid tumours. [41] Altered taste is one of the most frequently reported symptoms in a patient affected by idiopathic facial paresis. Patients had a reduced or abolished taste sensation (कण्टकैश्चाचिता जिह्वा) in the ipsilateral half tongue. The difference can be explained by the fact that patients can still use the normal side of the tongue for the taste function. Sialometry is the reliable prognostic examination to identify patients with good or poor facial outcomes at 12 months, by using powerful secretory stimulus in the patients of BP (Bell's palsy). Some patients of BP complain dry mouth (कण्टकैश्चाचिता जिह्वा) and this record was found to be correlated with severe facial paralysis at the onset and was found to be prognostic for a severe grade of paralysis at 10 days. It has been found that there is a reduced salivary flow rate (कण्टकैश्चाचिता जिह्वा) from the parotid gland on the paralysed side compared to the healthy side. [42] The above verse denotes idiopathic facial paresis or Bell's palsy.

शेफश्चात्यर्थमुत्सिकं निःसृतौ वृषणौ भृशम्। अतश्चैव विपर्यासो विकृत्या प्रेतलक्षणम्॥

Shephascha --- preta lakshanam [*Verse* 30] [2]

Testicular volume of cryptorchid patients was significantly decreased (निःसृतौ वृषणौ) when compared to the volume of descended testicles. [43] Decline in testicular size or testicular atrophy (निःसृतौ वृषणौ) has been found in old age, chronic and terminal illness, alcoholism, malignancy (higher risk of testicular atrophy among those dying in the hospital with malignancy and metastasis) (विकृत्या प्रेतलक्षणम्), and malnutrition. [44] Due to the testicular atrophy or decline in testicular volume, penis comparatively looks long or stretched (शेफश्चात्यर्थमुत्सिकम्) (but not necessarily). Adult acquired buried penis (अतश्चैव विपर्यासो) represents the clinical manifestation of a wide spectrum of pathology due to a variety of etiologies. It can be related to obesity, a laxity in connective tissue, lichen sclerosis (LS), complications from penile/scrotal enlargement surgery, scrotal lymphedema, or hidradenitis suppurativa (HS) and Fournier's gangrene. [45] 'शेफश्चात्यर्थमुत्सिकं निःसृतौ वृषणौ' denotes a condition where penis looks long or stretched and testicles looks as small in size compared to penis (seen in acquired cryptorchidism or testicular atrophy due to various causes); 'अतश्चैव विपर्यासो' denotes a condition where testicles looks bigger or large and penis looks small or short in size compared to testicles (indicates 'buried penis' due to various causes).

निचितं यस्य मांसं स्यात्वगास्थिष्वेव दृश्यते। क्षीणस्यानश्नतस्तस्य मासमायुः परं भवेत्॥

Nichitam --- param bhavet [*Verse* 31] [2]

'निचितमिति क्षीणम्' denote muscular atrophy whereas 'निचितमुपचित मांसं स्यात्' denotes muscular dystrophy or hypertrophy or neoplasm. 'त्वगास्थिष्वेव' represents cachexia or emaciation. Deterioration of nutritional status is frequently observed in the clinical course of acute and chronic diseases, and contributes to worse outcome. „ Disease-associated malnutrition, also defined as cachexia, is characterized weight loss and muscle wasting. Muscle wasting has been demonstrated to robustly predict complications. „ Cachexia is a syndrome with a continuum of signs and symptoms ranging from subtle metabolic disturbances to nutritional devastation. „ Changes in appetite (अनश्नतस्तस्य), increased inflammatory response, metabolic disturbances and weight loss (क्षीणस्य) allow the diagnosis of precachexia. Cancer cachexia is a multifactorial syndrome characterized by an ongoing loss of skeletal muscle mass which cannot be fully reversed by conventional nutritional support and leads to progressive functional impairment. [46] Sarcopenia, which represents the degenerative and systemic loss of skeletal muscle mass, is a multifactorial syndrome caused by various clinical conditions. Sarcopenia reflects not only frailty and poor general health status, but also the possible presence of advanced or progressive cancer or cancer cachexia. Sarcopenia reflects one of the manifestations of cancer cachexia, but sarcopenia includes skeletal muscle mass loss caused by other etiologies, such as aging and physical inactivity. [47] Duchenne and Becker muscular dystrophy (DMD & BMD) in humans are progressive

diseases leads primarily to muscle atrophy with certain muscles undergoing paradoxical hypertrophy. Muscle hypertrophy (निचितमुपचित मांसम्) in humans has generally been attributed to deposition of fat and connective tissue (pseudohypertrophy), but recent imaging studies suggest that increased muscle mass (true hypertrophy) (निचितमुपचित मांसम्) also occurs. [48] The above verse denotes 'Cancer cachexia'.

इदं लिङ्गमरिष्टाख्यमनेकमभिजञ्जिवान्। आयुर्वेदविदित्याख्यां लभते कुशलो जनः॥
Idam --- kushalo jana [*Verse* 32] [2]

The word 'अनेक' in above verse indicates that 'अरिष्ट लक्षण' are diverse and multiple. Though it is not possible to explain all of them, physician should be aware and alert to find them with his logical or analytical thinking.

CONCLUSION:

'रूपां कुमारिकाम' or examining the pupillary reflections is a unique contribution of *Ayurveda* in diagnosing and assessing the prognosis of various conditions. Now a day's pupillary reflections in photographs are helping investigators to solve crime (in forensics). Red reflex examination used in ophthalmological settings is also similar to the 'रूपां कुमारिकाम् परीक्षेत' concept explained in this chapter. Concept of diagnosing a disease or assessing prognosis based on 'छाया' and 'प्रतिच्छाया' (reflections and shadows) is also another unique concept of *Ayurveda* and plenty of research is required to substantiate and standardize these concepts. Though these techniques are cost effective, non-invasive and simple, they should be tested on sensitivity, specificity and accuracy etc various statistical parameters. Concept of 'प्रभा', is also a great contribution by *Ayurveda*, which is found to be very close to the concepts of 'AURA'. Research works are required to standardize the physiological and pathological features of 'प्रभा' by using 'Kirlain photography'. Various scales like 'Fitzpatrick skin type scale', 'Luschan's chromatic scale' and 'C.L.B.T assessment' etc can be used to standardize the five types of skin complexions (नाभसी, वायवी, आग्नेयी, अम्भसी and पार्थिवी) explained in this chapter. Various instruments like Differential scanning calorimetry (DSC), Skin capacitance method, Skin conductance, Moisture map (to measure स्निग्धता), Skicon, SkinChip, Coreometer, Nova Dermal phase meter, Surface characterizing impedance monitor (SCIM) (to measure रूक्षता), Cutometer, DermaFlex (measures skin elasticity), Attenuated total reflection infrared spectroscopy (ATR-IR / ATR- FTIR), and BIOSPEC imager (to measure skin hydration) etc [49] are available to measure different skin characteristics like निर्मलता, स्निग्धता, रूक्षता, विशुध्दता, दीप्तता, दर्शनप्रियता, स्थिरता, घनता and श्लक्ष्णता etc; Research works are required to standardize and to measure these *Ayurvedic* skin parameters (स्निग्धता, रूक्षता, स्थिरता, घनता etc) with the above instruments. Various life threatening conditions like 'Hepatic encephalopathy', 'Central vertigo', 'Hypercatabolic syndrome', 'Status epilepticus', 'Hypovolemic shock', 'Hemorrhagic shock', 'Delirium', 'Ocuogyric crisis', 'Cachexia', 'Carcinomas', 'Mumps', 'Bell's palsy', 'Buried penis' and 'Sarcopenia' etc are mentioned in this chapter. Further research works are required to substantiate the clinical findings quoted in this chapter.

Table 1: Five types of *Chhaya* (skin complexions) and their characteristic features

Parameter	नाभसी (*Naabhasi*)	वायवी (*Vaayavi*)	आग्नेयी (*Aagneyi*)	अम्भसी (*Ambhasi*)	पार्थिवी (*Paarthivi*)
Colour	नीला (*Neela*)	श्यावारुणा (*Shyaavaaruna*)	रक्ता (*Rakta*)	वैदूर्य (*Vaidurya*)	श्यामाश्वेता (*Shyamashweta*)
Luminosity	सप्रभा (*Saprabha*)	हतप्रभा (*Hataprabha*)	दीप्ताभा (*Diptabha*)	--	--
Brightness	निर्मला (*Nirmala*)	--	--	विमला (Vimala)	श्लक्ष्णा (*Shlakshna*)
Transparency	--	--	विशुध्दा (*Vishuddha*)	शुध्दा (*Shuddha*)	--
Hydration & Elasticity	सस्नेहा (*Sasneha*)	रूक्षा (*Ruksha*)	--	सुस्निग्धा (*Susnigdha*)	स्निग्धा (Snigdha)
Homogeneity	--	--	दर्शनप्रिया (*Darshana priya*)	--	श्लक्ष्णा (*Shlakshna*)
Firmness	--	--	--	--	स्थिरा घना (*Sthira ghana*)
Imperfections	--	रूक्षा (*Ruksha*)	--	--	--

Table 2: Difference between *Chhaya* and *Prabha*

Chhaya	*Prabha*
Dependant on *Varna* and *Prabha*	Illuminates *Varna* and it is independent
Easily detectable when the person in nearer	Illuminates from a distance
Five types (नाभसी, वायवी, आग्नेयी, अम्भसी and पार्थिवी) (*Naabhasi, Vaayavi, Aagneyi, Ambhasi* & *Paarthivi*)	Seven types (रक्ता, पीता, सिता, श्यावा, हरिता, पाण्डु and असिता) (*Rakta, Peeta, Sitaa, Shyaava, Harita, Paandu* & *Asitaa*)
Originates from any of the 'महाभूत' (*Mahabhuta*)	Originates from 'तेजोमहाभूत' (*Tejo mahabhuta*) only
वायवी छाया (*Vaayavi chhaya*) is inauspicious	रूक्ष मलिन संक्लिष्ट (*Ruksha, Malina* & *Sanklishta*) are inauspicious
Denotes skin complexion	Denotes skin radiance or luminance or AURA
Can be measured or differentiated by using various scales like 'Fitzpatrick skin type scale', 'Luschan's chromatic scale', C.L.B.T (skin colour, luminance, brightness and transparency) etc;	Can be measured by using 'Optical method having three parameters like Complexion / diffusion' (Cd), Complexion / reflection (Cr), Complexion / specular position (Csp), and C.L.B.T etc;

Table 3: Various *Arishta lakshanas*

Arishta lakshana	Relevant disease or pathology
कामला ---- परिवर्जयेत् *Kamala --- parivarjayet* (Ch. I. 7 / 18)	Hepatic encephalopathy; Cirrhosis of liver; Infective hepatitis; Hepatocellular carcinoma; Hepatoblastoma;
उत्थाप्यमानः --- विकत्थनः *Uthaapya --- vikathana* (Ch. I. 7 / 19)	Central vertigo; Vertebrobasilar insufficiency; Cerebrovascular accidents; Carotid artery stenosis;
संसृष्टा व्याधयो --- न जीवति *Sansrushta --- na jeevati* (Ch. I. 7 / 20)	Carcinomas with secondary or distal metastases; Various autoimmune, neuromuscular, muscular dystrophies; Bleeding disorders; Malabsorption syndromes; Small intestinal bacterial overgrowth (SIBO)
उपरुध्दस्य ---- प्रेतस्तथैव सः *Uparuddhasya --- pretastathaiva sa* (Ch. I. 7 / 21 & 22)	End stage renal disease (ESRD); Acute kidney injury (AKI); Carcinomas; Malabsorption syndrome; Thyrotoxicosis; Fecal impaction; Intestinal (complete or partial) obstruction; Pelvic neoplasms; End stage liver disease (ESLD); Hypercatabolic syndrome;
इष्टं च ---- न स जीवति *Ishtam cha --- na jeevati* (Ch. I. 7 / 23)	Hypercatabolic syndrome; Thyrotoxicosis; Carcinomas; Cachexia; Sarcopenia;
प्रकृजति ---- न स जीवति *Prakujati --- na sa jeevati* (Ch. I. 7 / 24)	Hypovolemic shock; Metabolic acidosis; Diabetic ketoacidosis; Fluid and electrolyte imbalance in hypovolemia; Cerebral hypoperfusion;
ह्रस्वं --- व्याचचक्षे पुनर्वसुः *Hrasvam --- Punarvasu* (Ch. I. 7 / 25)	Delirium (increased psychomotor activity subtype or hyperactive); Status epilepticus; Cerebral hypoperfusion;
ऊर्ध्वं च --- न स जीवति *Urdhvam cha --- jeevati* (Ch. I. 7 / 26)	Pulmonary edema; Lung cancer; Pulmonary embolism; Pulmonary cachexia; Pulmonary tuberculosis;
ऊर्ध्वाग्रे नयने --- न स जीवति *Urdhvaagre --- na jeevati* (Ch. I. 7 / 27)	Cerebral hypoperfusion; Cerebral ischemia; Perinaud's syndrome; Oculogyric crisis; Stenosis or aneurysm or kinking or atherosclerosis or dissection of carotid artery;
यस्य गण्डावुपचितौ ---- कर्म न सिध्यति *Yasya --- na siddhyati* (Ch. I. 7 / 28)	Mumps; Diphtheria; Bilateral parotid tuberculosis; Other neoplastic or infectious diseases of salivary glands;
व्यावृत्तमूर्धजिह्वास्यो ---- प्रेतस्तथैव सः *Vyaavrutta --- pretastathaiva sa* (Ch. I. 7 / 29)	Idiopathic facial paresis; Bell's palsy;
शेफश्चात्यर्थमुत्सिक्तं ---- प्रेतलक्षणम् *Shopha --- lakshanam* (Ch. I. 7 / 30)	Acquired cryptorchidism; Testicular atrophy in carcinoma; Buried penis; Penile carcinoma;
निचितं यस्य मांसं ---- भवेत् *Nichitam --- bhavet* (Ch. I. 7 / 31)	Cancer cachexia; Sarcopenia; Muscular dystrophies or hypertrophies;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

REFERENCES:

1. Goswami PK. Comparative studies of Bhanumati and Nibandha samgraha with special reference to Arishta vignana (prognostic science). AYU 2011; 32: 147-153. Available from: http://www.ayujournal.org/text.asp?2011/32/2/147/92540
2. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 7th chapter: Pannarupeeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 365-366.
3. Nitschke C, Nakazawa A, Takemura H. Corneal imaging revisited: An overview of corneal reflection analysis and applications. IPSJ Transactions on Computer Vision and Applications. 2013; 5: 1-8. doi: 10.2197/ipsjtcva.5.1
4. Levin AV. Red reflex: Procedures and assessments video series. Can Fam Physician. 2014; 60 (3): 257. PMID: 24627383; PMCID: PMC3952763.
5. Tuli SY, Giordano BP, Kelly M, Fillipps D, Tuli SS. Newborn with an absent red reflex. J Pediatr Health Care. 2013; 27 (1):

51-55. doi: 10.1016/j.pedhc.2011.10.010. PMID: 22197583; PMCID: PMC3650609.
6. Pavani F, Galfano G. The multisensory body revealed through its cast shadows. Front Psychol. 2015; 6: 666. doi: 10.3389/fpsyg.2015.00666. PMID: 26042079; PMCID: PMC4436799.
7. Périn FA, Saetun KA, Pungpod PA, Pram-On MO, Périn VE, Aroonrat NI, Siritemboon C, Dhavan V. A new method for the in vivo visual evaluation of the radiance of the Asian skin complexion. In Conference of the Asian Societies of Cosmetics Scientists, Singapore 2007 Mar 7. Available from: https://pdfs.semanticscholar.org/9a1f/85427ac9923a191e8cac24e5ac0621d1df97.pdf
8. Stephen ID, Coetzee V, Law Smith M, Perrett DI (2009) Skin Blood Perfusion and Oxygenation Colour Affect Perceived Human Health. PLoS ONE 4 (4): e5083. doi:10.1371/journal.pone.0005083
9. Ortonne JP. Normal and abnormal skin color. In Annales de Dermatologie et de Vénéréologie 2012; 139: S125-S129. Elsevier Masson. https://doi.org/10.1016/S0151-9638(12)70123-0
10. Genovese L, Corbo A, Sibilla S: An Insight into the Changes in Skin Texture and Properties following Dietary Intervention with a Nutricosmeceutical Containing a Blend of Collagen Bioactive Peptides and Antioxidants. Skin Pharmacol Physiol 2017; 30: 146-158. doi: 10.1159/000464470
11. Chhabra GU, Narayanan AP, Samantha SO, Samanta S. Human aura: A new vedic approach in IT. In Proceedings of the International Conference on Mechanical and Industrial Engineering, 2013. p. 5-7. Available from: https://www.researchgate.net/profile/Gunjan_Chhabra/publication/280876417_HUMAN_AURA_A_NEW_VEDIC_APPROACH_IN_IT/links/55c9b24a08aebc967df92cbd.pdf
12. Priya BS, Rajesh R. Understanding abnormal energy levels in aura images. In Proceedings of the International Conference on Artificial Intelligence and Machine Learning, Dubai 2011; P. 75-81.
13. Priyal VV, Ramkumar N. Effect of Aura-Chakra, Yoga and spirituality on an individual's performance in the workplace. Ethno Med. 2016; 10 (2): 166-177. https://doi.org/10.1080/09735070.2016.11905485
14. St John Tina M. Signs and symptoms that may be associated with hepatitis C. Caring Ambassad Hepat C Choices Inc. 2008; 4: 43. Available from: https://hepcchallenge.org/wp-content/uploads/2017/09/Chapter_05.pdf
15. Talwani R, Gilliam BL, Howell C. Infectious diseases and the liver. Clin Liver Dis. 2011; 15 (1): 111-130. doi: 10.1016/j.cld.2010.09.002. PMID: 21111996; PMCID: PMC3660095.
16. Djiambou-Nganjeu H. Hepatic Encephalopathy in Liver Cirrhosis. J Transl Int Med. 2017; 5 (1): 64-67. doi: 10.1515/jtim-2017-0013. PMID: 28680841; PMCID: PMC5490964.
17. Lee AT. Diagnosing the cause of vertigo: a practical approach. Hong Kong Med J. 2012; 18 (4): 327-332. Available from: https://www.hkmj.org/system/files/hkm1208p327.pdf
18. Shaheen O, Ghibour A, Alsaid B. Esophageal Cancer Metastases to Unexpected Sites: A Systematic Review. Gastroenterol Res Pract. 2017; 2017: 1657310. doi: 10.1155/2017/1657310. PMID: 28659974; PMCID: PMC5474273.
19. Villazon A, Portos J, Sierra A. Polyuric syndromes in the critically ill patient. Crit Care Med. 1976; 4 (1): 24-31. Available from: https://journals.lww.com/ccmjournal/Abstract/1976/01000/Polyuric_syndromes_in_the_critically_ill_patient.6.aspx
20. Cherny NI. Evaluation and management of treatment-related diarrhoea in patients with advanced cancer: a review. J Pain Symptom Manag. 2008; 36 (4): 413-423. doi:10.1016/j.jpainsymman.2007.10.007
21. Klein SJ, Lehner GF, Forni LG, Joannidis M. Oliguria in critically ill patients: a narrative review. J Nephrol. 2018; 31 (6): 855-862. doi: 10.1007/s40620-018-0539-6. PMID: 30298272; PMCID: PMC6244549.
22. Amathieu R, Al-Khafaji A, Sileanu FE, Foldes E, DeSensi R, Hilmi I, Kellum JA. Significance of oliguria in critically ill patients with chronic liver disease. Hepatology. 2017; 66 (5):1592-600. doi: https://doi.org/10.1002/hep.29303
23. Selius BA, Subedi R. Urinary retention in adults: diagnosis and initial management. Am Fam Physician 2008; 77 (5): 643-650. Available from: https://www.aafp.org/afp/2008/0301/p643.html
24. Cummings JH, Bingham SA, Heaton KW, Eastwood MA. Fecal weight, colon cancer risk, and dietary intake of nonstarch polysaccharides (dietary fiber). Gastroenterology. 1992; 103 (6): 1783-1789. Available from: https://www.gastrojournal.org/article/0016-5085(92)91435-7/fulltext
25. Obokhare I. Fecal impaction: a cause for concern? Clin Colon Rectal Surg. 2012; 25 (1): 53-58. doi: 10.1055/s-0032-1301760. PMID: 23449376; PMCID: PMC3348734.
26. Pasini E, Aquilani R, Dioguardi FS, D'Antona G, Gheorghiade M, Taegtmeyer H. Hypercatabolic syndrome: molecular basis and effects of nutritional supplements with amino acids. Am J Cardiol. 2008; 101 (11): S11-15. doi: 10.1016/j.amjcard.2008.02.074
27. Sharma K, Mogensen KM, Robinson MK. Pathophysiology of critical illness and role of nutrition. Nutr Clin Pract 2019; 34 (1): 12-22. doi: 10.1002/ncp.10232
28. Taghavi S, Askari R. Hypovolemic Shock. [Updated 2019 Jun 18]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK513297/
29. Shagana JA, Dhanraj M, Jain AR, Nir Osa T. Hypovolemic shock - A review. Drug Invention Today. 2018; 10 (7): 1102-1105. Available from: https://www.researchgate.net/profile/Ashish_Jain52/publication/328567156_Hypovolemic_shock_-_A_review/links/5c5d9fb9a6fdccb608b0b7a4/Hypovolemic-shock-A-review.pdf
30. Cherian A, Thomas SV. Status epilepticus. Ann Indian Acad Neurol. 2009; 12 (3): 140-153. doi: 10.4103/0972-2327.56312. PMID: 20174493; PMCID: PMC2824929.
31. Martins S, Fernandes L. Delirium in elderly people: a review. Front Neurol. 2012; 3: 101. doi: 10.3389/fneur.2012.00101. PMID: 22723791; PMCID: PMC3377955.
32. Luisada AA, Cardi L. Acute pulmonary oedema: Pathology, Physiology and Clinical management. Circulation 1956; 13: 113-135. Available from: https://www.ahajournals.org/doi/pdf/10.1161/01.CIR.13.1.113
33. Williams AC, Grant M, Tiep B, Kim JY, Hayter J. Dyspnea Management in Early Stage Lung Cancer: A Palliative Perspective. J Hosp Palliat Nurs. 2012; 14 (5): 341-342. doi: 10.1097/NJH.0b013e31825e4250. PMID: 24058283; PMCID: PMC3776584.
34. Tsai YH, Yang JL, Lee IN, Yang JT, Lin LC, Huang YC, Yeh MY, Weng HH and Su CH. Effects of Dehydration on Brain Perfusion and Infarct Core After Acute Middle Cerebral Artery Occlusion in Rats: Evidence From High-Field Magnetic Resonance Imaging. Front. Neurol. 2018; 9: 786. doi: 10.3389/fneur.2018.00786
35. Rowe FJ, Wright D, Brand D, Jackson C, Harrison S, Maan T, Scott C, Vogwell L, Peel S, Akerman N, Dodridge C. Profile of gaze dysfunction following cerebrovascular accident. ISRN ophthalmology. 2013; 2013. https://doi.org/10.1155/2013/264604
36. Keane JR. Sustained upgaze in coma. Annals of Neurology: Official Journal of the American Neurological Association and the Child Neurology Society. 1981; 9 (4): 409-412. Available from: https://doi.org/10.1002/ana.410090418
37. Johkura K, Komiyama A, Kuroiwa Y. Vertical conjugate eye deviation in postresuscitation coma. Annals of Neurology: Official Journal of the American Neurological Association and the Child Neurology Society. 2004; 56 (6): 878-881. https://doi.org/10.1002/ana.20303
38. Gold DR (2019). In Liu, Volpe, and Galetta's Neuro-Ophthalmology (Third Edition). Eye movement disorders -

Conjugate gaze abnormalities. Elsevier. p. 549-584. https://doi.org/10.1016/B978-0-323-34044-1.00016-X
39. Rubin S, Eckhaus M, Rennick LJ, Bamford CG, Duprex WP. Molecular biology, pathogenesis and pathology of mumps virus. J Pathol. 2015; 235 (2): 242-252. doi: 10.1002/path.4445. PMID: 25229387; PMCID: PMC4268314.
40. Mehanna H, McQueen A, Robinson M, Paleri V. Salivary gland swellings. BMJ 2012; 345: e6794. doi: 10.1136/bmj.e6794.
41. Heckmann JG, Urban PP, Pitz S, Guntinas-Lichius O, Gágyor I. The Diagnosis and Treatment of Idiopathic Facial Paresis (Bell's Palsy). Dtsch Arztebl Int. 2019; 116 (41): 692-702. doi: 10.3238/arztebl.2019.0692. PMID: 31709978; PMCID: PMC6865187.
42. De Seta D, Mancini P, Minni A, Prosperini L, De Seta E, Attanasio G, Covelli E, De Carlo A, Filipo R. Bell's palsy: symptoms preceding and accompanying the facial paresis. The Scientific World Journal. 2014; 2014. https://doi.org/10.1155/2014/801971
43. Zvizdic Z, Milisic E, Halimic A, Zvizdic D, Zubovic SV. Testicular volume and testicular atrophy index as predictors of functionality of unilaterally cryptorchid testis. Med Arch. 2014; 68 (2): 79-82. doi: 10.5455/medarh.2014.68.79-82. PMID: 24937926; PMCID: PMC4272499.
44. Handelsman DJ, Staraj S. Testicular size: the effects of aging, malnutrition, and illness. J Androl. 1985; 6 (3): 144-151. Available from: https://onlinelibrary.wiley.com/doi/pdf/10.1002/j.1939-4640.1985.tb00830.x
45. Ho TS, Gelman J. Evaluation and management of adult acquired buried penis. Transl Androl Urol. 2018; 7 (4): 618-627. doi: 10.21037/tau.2018.05.06. PMID: 30211051; PMCID: PMC6127540.
46. Laviano A, Paldino A. Diagnosing cachexia. Clin Pract 2014; 11 (1): 71-78. doi: 10.2217/CPR.13.87
47. Fukushima H, Fujii Y, Koga F. Metabolic and Molecular Basis of Sarcopenia: Implications in the Management of Urothelial Carcinoma. Int J Mol Sci. 2019; 20 (3): 760. doi: 10.3390/ijms20030760. PMID: 30754663; PMCID: PMC6387186.
48. Kornegay JN, Childers MK, Bogan DJ, Bogan JR, Nghiem P, Wang J, Fan Z, Howard JF Jr, Schatzberg SJ, Dow JL, Grange RW, Styner MA, Hoffman EP, Wagner KR. The paradox of muscle hypertrophy in muscular dystrophy. Phys Med Rehabil Clin N Am. 2012; 23 (1): 149-172. doi: 10.1016/j.pmr.2011.11.014. PMID: 22239881; PMCID: PMC5951392.
49. Qassem M, Kyriacou P. Review of Modern Techniques for the Assessment of Skin Hydration. Cosmetics. 2019; 6 (1):19. doi:10.3390/cosmetics6010019

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AVAAKSHIRASEEYAM OF *CHARAKA INDRIYA STHANA* -AN EXPLORATIVE STUDY

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REVIEW ARTICLE

AVAAKSHIRASEEYAM OF *CHARAKA INDRIYA STHANA* - AN EXPLORATIVE STUDY

Abstract:
According to *Ayurveda* (an ancient Indian traditional system of medicine), death won't occur without the prior manifestation of '*Arishta lakshanas*' (fatal signs and symptoms which indicates imminent death). '*Arishta lakshanas*' are the red flag signs and symptoms which can be seen in dying patient. The physician should not treat the patient possessing '*Arishta lakshanas*'. '*Avaak shiraseeyam indriyam*' is the name of the 8th chapter of '*Indriya sthana*' (one among the 8 sections of *Charaka samhita*, deals with prognostic aspects) of '*Charaka samhita*' (popular ancient *Ayurvedic* textbook of medicine). The present chapter deals with various '*Arishta lakshanas*' which leads to death immediately or within three or six days. The present study is aimed to explore the various concepts mentioned in this chapter and also their prognostic significance in present era. Various conditions such as 'Grave's ophthalmopathy', 'Sensory and autonomic neuropathies', 'Saddle nose', 'Tumours of head and neck', 'Cutaneous flushing due to neuroendocrinal diseases', 'Dental flourosis', 'Rickets', 'Bulbar palsy', 'Neuromuscular disorders', 'Hypovolemic shock', 'Status epilepticus', 'Delirium', 'Trichotilliomania', 'Bruxism', 'Self injurious behaviours', 'Tourette's syndrome', 'Catatonia', 'Negative symptoms of schizophrenia', 'Septic shock', 'Oropharyngeal dysphagia' and 'Pheochromocytoma' etc are explained in this chapter which are fatal and having poor prognosis even today. This chapter also states the momentary or transient or fluctuating nature *arishta lakshanas* and alerts the physician to detect them whenever they manifest. Further research works are required to substantiate the clinical findings quoted in this chapter. The association between *arishta lakshanas* and death due to different disease conditions as mentioned in this chapter should be tested on various statistical parameters like sensitivity, specificity, positive and negative predictive values, false positives, and false negatives etc.

Key Words: Bruxism, Catatonia, Neuromuscular disorders, Schizophrenia, Tourette's syndrome, Trichotillomania

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INTRODUCTION:

According to *Ayurveda* (an ancient Indian traditional system of medicine), death won't occur without the prior manifestation of '*Arishta lakshanas*' (fatal signs and symptoms which indicates imminent death). '*Arishta lakshanas*' are the red flag signs and symptoms which can be seen in dying patient. The physician should not treat the patient possessing '*Arishta lakshanas*'. '*Arishta lakshanas*' denote irreversibility of the disease condition and poor prognosis; hence physician should avoid treating such cases. [1] *Charaka samhita* is considered as one of the oldest treatises recording attempt at systematisation of knowledge in a specific area (medicine). *Indriya sthana* is one among the eight sections of *Charaka samhita*, which deals with prognosis. Prognostication of life expectancy or estimating survival time frames in dying patients and *Arishta lakshanas* are mentioned in *Indriya sthana*. [2]

'*Avaak shiraseeyam indriyam*' is the name of the 8th chapter of '*Indriya sthana*' of '*Charaka samhita*'. The present chapter deals with various '*Arishta lakshana's*' which leads to death immediately or within three or six days. The word '*Avaakshira'* denotes 'inverted shadow'. '*Arishta lakshana's*' mentioned in this chapter denote various underlying fatal conditions (Table 1&2), which the physician should avoid to treat. [3] The present study is aimed to explore the various concepts mentioned in this chapter and also their prognostic significance in present era.

MAIN CONTENTS (Table 1&2):

अवाक्शिरा वा जिह्वा वा यस्य वा विशिरा भवेत्। जन्तो रूपप्रतिच्छाया नैनमिच्छेच्चिकित्सितुम्॥

Avaakshira --- chikitsitum [*Verse* 3] [3]

As explained in the previous chapter, in the absence of radiodiagnosis and imaging technology (ultrasound, X-ray, magnetic resonance imaging etc) in ancient India, *Ayurvedic* practitioners have developed their own methods to diagnose and detect deep seated, invisible, subtle pathologies by studying the body shadows or reflections of the patients. Any abnormalities found in the shadows or reflections (जन्तो रूपप्रतिच्छाया) of body or body parts (अवाक्शिरा वा जिह्वा वा यस्य वा विशिरा) denote an underlying pathology (which can't be detectable or identifiable by direct examination) and an imminent death. The presence of body shadow has recently been a target of an increasing number of studies, mainly showing that information conveyed by shadows can support several tasks performed in everyday life. Body shadow processing can be reflected at the level of the human mirror neuron system, even when shadows are not relevant for the specific task. Body shadows are potentially capable of contributing to the construction

of the internal representation of body shape and its extension in space. When applied to body shadows, the shadow-correspondence problem may thus be central to a perceptual decision that promotes self-identification and self-recognition. Body shadow may represent a high-priority class of stimuli that act by "pushing" attention toward the body itself. [4] Some studies have proved that people can be identified by their shadows using body biometrics. [5] Shadow analysis is still in its infancy and plenty of research works are required to substantiate and to standardize the above claims.

जटीभूतानि पक्ष्माणि दृष्टिश्चापि निगृह्यते। यस्य जन्तोर्न तं धीरो भेषजेनोपपादयेत॥

Jateebhutaani --- nopapaadayet [*Verse* 4] [3]

'जटीभूतानि पक्ष्माणि' denote blepharitis and 'दृष्टिश्चापि निगृह्यते' denotes sudden or transient loss of vision. Eyelashes may become infected, and the individual cilia become matted (जटीभूतानि पक्ष्माणि) from the host inflammatory response. This is usually attributed to coagulase-negative staphylococci or blepharitis caused by dermatophytes such as Microsporum canis or Yeasts such as Candida species. The lipophilic fungus Malassezia furfur, likely normal microbiota of the adult pilosebaceous unit has been implicated as a cause of blepharitis. [6] Demodex infestation (demodicosis or demodicidosis) caused by Primary or secondary immunodepression (malignant neoplasia, hepatopathies, lymphosarcoma, and HIV infections). Demodex is an ecto-parasite of pilo-sebaceous follicle and sebaceous gland, typically found on the face including cheeks, nose, chin, forehead, temples, eye lashes, brows, and also on the balding scalp, neck, ears.[7] Eyelid deposits like collarettes or cuffs of fibrin (matted, hard scales) (जटीभूतानि पक्ष्माणि) extending from the base of and along lashes as a sleeve is found in Anterior blepharitis (Staphylococcal); Greasy scales (scurf) (जटीभूतानि पक्ष्माणि) on lid margins and around lashes are found in Anterior blepharitis (Seborrheic); Thick lipid secretions (foamy) (जटीभूतानि पक्ष्माणि) with plugged and pouting meibomian gland orifices is seen in 'Posterior blepharitis' / 'Meibomian gland dysfunction' (MGD).[8]

Transient vision loss (दृष्टिश्चापि निगृह्यते) due to ischemia is also known as amaurosis fugax. Vision loss caused by ischemia (दृष्टिश्चापि निगृह्यते) is characterized by sudden, painless darkening of vision in association with partial or complete visual field defects. Most of the visual disturbances are negative phenomena, such as diffuse loss of vision, a curtain coming down (altitudinal field defect), nasal or temporal vision loss, constriction of the visual field, and dark spots. In terms of the pathology of ischemia, thromboembolic causes include cardiac thromboemboli (atrial fibrillation, valvular disease), carotid thromboemboli (atherosclerosis, dissection), aortic arch emboli, and hypercoagulability. Hemodynamic causes include postural hypotension, malignant hypertension, and high blood viscosity. Vascular causes of transient vision loss due to ischemia include vasculitis, vasospasm, arteriovenous fistula and vertebrobasilar insufficiency. [9] Rheumatoid arthritis, juvenile rheumatoid arthritis, Sjögren's syndrome, the seronegative spondyloarthropathies, systemic lupus erythematosus, multiple sclerosis, giant cell arteritis, and Graves' disease are autoimmune disorders commonly encountered by family physicians. These autoimmune disorders can have devastating systemic and ocular effects. Ocular symptoms may include dry or red eyes, foreign-body sensation, pruritus, photophobia, pain, visual changes, and even complete loss of vision. [10] The above verse denotes various conditions like 'Blepharitis or parasitic or fungal eye infections with secondary immunosupression' or an 'Automminue disease with ocular manifestations'.

यस्य शूनानि वर्त्मानि न समायान्ति शुष्यतः। चक्षुषी चोपदिह्येते यथा प्रेतस्तथैव सः॥

Yasya shunaani --- pretastathaiva sa [*Verse* 5] [3]

Graves' ophthalmopathy (GO), also called Graves' orbitopathy, is a potentially sight-threatening ocular disease. Generally occurring in patients with hyperthyroidism or a history of hyperthyroidism due to Graves' disease, 'GO' is also known as thyroid-associated ophthalmopathy or thyroid eye disease. 'GO' is characterized by a dry and gritty ocular sensation, photophobia, excessive tearing, double vision, and a pressure sensation behind the eyes. The most common clinical features of 'GO' are upper eyelid retraction (वर्त्मानि न समायान्ति), edema (शूनानि वर्त्मानि), and erythema of the periorbital tissues and conjunctivae (चक्षुषी चोपदिह्येते), and proptosis. Some patients with 'GO' have severe disease with intense pain, inflammation, and sight-threatening corneal ulceration or compressive optic neuropathy (शुष्यतः?). [11]

भ्रुवोर्वा यदि वा मूर्ध्नि सीमन्तावर्तकान् बहून्। अपूर्वानकृतान् व्यक्तान् दृष्ट्वा मरणमादिशेत्॥

त्र्यहमेतेन जीवन्ति लक्षणेनातुरा नराः। अरोगाणां पुनस्त्वेतत् षड्रात्रं परमुच्यते॥

Bhruvorva --- paramuchyate [*Verse* 6-7] [3]

There is an evidence that the number of occipital whorls (usually one or two), the rotation of the whorl (clockwise or anticlockwise), and the location of the whorl or whorls (in the midline or to the right or left of the midline) are all features under genetic control, though most of the available data are vague. Some studies have suggested that anticlockwise rotation tended to be dominant to clockwise. The number and direction of rotation of scalp patterns are familial traits, the exact mechanisms of inheritance being unclear. Patients with Down's syndrome had a highly significant excess of midline occipital whorls and a deficit of right-sided occipital whorls. Patients with

microcephaly had a distinct 'upsweep' of the frontal hair. Patients with unspecified mental subnormality had a highly significant deficit of multiple occipital whorls. Observation of hair patterns in individual patients with mental subnormality is of theoretical interest but is unlikely to be of great practical value. [12] The mechanical theory suggests that hair whorl patterning is determined by the tension on the epidermis during rapid expansion of the cranium while the hair follicle is growing downwards, however this was experimentally unproven. It has been found that under certain conditions, spirals on the scalp can be recreated experimentally to demonstrate that the basis of scalp whorls is indeed mechanical and that logarithmic spirals may be nature's own design for rapid expansion of organic tissues. [13]

The scalp is unique among skin areas in humans, with high follicular density and a high rate of sebum production. The relatively dark and warm environment on the scalp surface provides a welcoming environment for the superficial mycotic infections associated with many scalp conditions and for parasitic infestation. The prevalence of increased sebum production is higher in immunocompromised patients than in healthy adults. Conditions associated with excessive sebum production like seborrheic dermatitis etc has been reported to occur significantly in AIDS patients. [14] Sudden appearance of 'सीमन्त' (Natural hair part or part line of hair or hair part) and 'आवर्तकान्' (Hair whorl or swirl or parietal whorl or crowns or trichoglyphs or cowlicks etc) over the scalp (मूर्ध्नि) and eye brows (भ्रुवो) without any visible cause or reason should be considered as '*Arishta'* (sign of imminent death within 3 days for a patient - 'त्र्यहमेतेन जीवन्ति लक्षणेनातुरा' and 6 days for a healthy person - 'अरोगाणां पुनस्त्वेतत् षड्रात्रम्'). The pathological manifestation of part lines and whorls is characterized by features like 'बहून्' (multiple or diverse), 'अपूर्वान्' (acquired or unprecedented or unique) and 'अकृतान्' (not made or not created mechanically) according to the above verse. It seems that the above verse denote an excessive sebum production (due to an underlying immunocompromised states or carcinomas or opportunistic scalp fungal infections or autonomic dysfunctions etc) due to which the scalp hair becomes sticky or oily or greasy which further may leads to the formation of new whorls, part lines etc on scalp and brows. Conditions like skull base tumours or metastatic skull tumours or brain tumours etc may stretch the scalp skin and this mechanical pressure may leads to the formation of new whorls or part lines. 'अरोगाणाम्' of the above verse denote latent or hidden pathology not necessarily the absence of disease.

आयम्योत्पाटितान् केशान् यो नरो नावबुध्यते। अनातुरो वा रोगी वा षड्रात्रं नातिवर्तते॥

Aayamya --- naativartate [*Verse* 8] [3]

Syringomyelia in the cervical region of the spinal cord is characterized by 'dissociated sensory loss' (loss of pain and temperature perception over the distribution of several dermatomes with preservation of touch and other forms of sensory perception in those areas) (नावबुध्यते). [15] Diminution or loss of pain sensation is termed hypoalgesia or analgesia. Injury or pathology of spino-thalamic tract or tracts may cause hypoalgesia or analgesia. [16] There is also a clinical presentation of leprosy without any skin lesions known as pure neuritic form (PNL). There is also a condition known as "silent neuropathy" (SN) (नावबुध्यते). It is characterized by the impairment of sensory and motor functions without skin signs, nerve tenderness, pain, paraesthesia or numbness symptoms of neuritis. It is also called "quiet nerve paralysis". In Leprosy neuropathy, patient comes with cutaneous sensory loss and mononeuropathy, or multiple mononeuropathy or polyneuropathy. Some patients with Leprosy may have a distal neuropathy with temperature and pain anaesthesia, due to a mononeuritis multiplex summation. Leprosy is known to involve only the exteroceptive sensations. Posterior tibial nerve involvement in leprosy causes anaesthesia on foot sole. [17]

DSDP (Diabetic symmetric distal polyneuropathy) is characterized by sensory disturbances like loss of vibration sense at the toes, loss of pin prick, temperature, and light touch sensations in a sock or stocking distribution, and if there is upper limb sensory loss in a glove distribution. Sensory loss puts the diabetic foot at risk of ulceration. Based on the relative loss of sensory modalities, the neuropathy can be divided into "large fibre type" (predominant loss of vibration, light touch, and joint position senses) and "small fibre type" (predominant loss of pain and temperature). In more severe cases, sensory loss can extend to involve the trunk, anterior chest / abdominal wall in a "breastplate" distribution, and also the trunk. [18] Most patients with sensory loss (नावबुध्यते) associated with the more common categories of peripheral neuropathy (e.g., CSPN - Cryptogenic sensory polyneuropathy and diabetes) will clinically have diminished light touch, pin, and vibration sensation, with proprioception affected in more severe cases. [19] According to a case report, greater occipital nerve compression results in unilateral scalp numbness (आयम्योत्पाटितान् केशान् यो नरो नावबुध्यते). [20] It has been found that, universal *sensory loss* including *sensory loss* over the face and *scalp* is seen (आयम्योत्पाटितान् केशान् यो नरो नावबुध्यते) in 'Acute sensory polyneuritis' bearing a close relationship to Guillain-Barre Syndrome (GBS). [21] It seems that the condition explained in the above verse denotes sensory neuropathy due to various underlying conditions.

यस्य केशा निरभ्यङ्गा दृश्यन्तेऽभ्यक्तसन्निभाः। उपरुध्दायुषं ज्ञात्वा तं धीरः परिवर्जयेत्॥

Yasya kesha --- parivarjayet [*Verse* 9] [3]

As explained in the previous verses excessive greasiness or stickiness (दृश्यन्तेऽभ्यक्तसन्निभाः) or scalp hair is due to excessive production of sebum due to various underlying conditions. The scalp is unique among skin areas in humans, with high follicular density and a high rate of sebum production. The prevalence of increased sebum production is higher in immuno-compromised patients (तं धीरः परिवर्जयेत् ?) than in healthy adults. Conditions associated with excessive sebum production like seborrheic dermatitis etc has been reported to occur significantly in AIDS patients. [14] The above verse indicates seborrhoea in an immunocompromised individual.

ग्लायते नासिकावंशः पृथुत्वं यस्य गच्छति। अशूनः शूनसंकाशः प्रत्याख्येयः स जानता॥

Glaayate --- jaanataa [*Verse* 10] [3]

Saddle-nose deformity can occur as a result of trauma to the nose, but it has also been well described in the setting of infections such as leprosy and syphilis and idiopathic inflammatory conditions (शूनसंकाशः) such as granulomatosis with polyangiitis (formerly known as Wegener granulomatosis) and relapsing polychondritis. Patients with saddle nose may present with epistaxis, deviation of the nasal septum (ग्लायते नासिकावंशः), nasal obstruction, collapse of cartilaginous dorsum of the nose and deformity of nose (ग्लायते नासिकावंशः पृथुत्वम्). [22]

Rhinophyma is a benign skin deformity characterized by tumorous growth leading to a large (पृथुत्वं यस्य गच्छति), bulbous, and erythematous appearing nose (अशूनः शूनसंकाशः). It is considered to be one characteristic of advanced stage IV rosacea. The exact cause of rhinophyma is unknown. The extravasation in rhinophyma leads to chronic edema (पृथुत्वं यस्य गच्छति) of the dermal interstitium with a sequela of local inflammation (अशूनः शूनसंकाशः), fibrosis, and dermal and sebaceous gland hyperplasia. Over time, this leads to the characteristic bright red to purplish telangiectasias and irregular, lobulated thickening of the skin of the nose. Rhinophyma can be identified by bulbous shape of the nose (पृथुत्वं यस्य गच्छति), skin pitting/scarring, and telangiectasias. Most commonly, the thicker and more sebaceous nasal tip and alae are preferentially enlarged, but involvement can spread to the thinner nasal dorsum and sidewalls to a lesser degree. Rhinophyma can be complicated by unnoticed cutaneous malignancies. Occult basal cell carcinoma is estimated to occur rhinophyma cases, while other types of skin cancers and systemic malignancies have been found to mimic rhinophyma. [23]

अत्यर्थंविवृता यस्य यस्य चात्यर्थसंवृता। जिह्मा वा परिशुष्का वा नासिका न स जीवति॥

Atyartha --- jeevati [*Verse* 11] [3]

Malignancy, though a rare cause of 'saddle-nose' deformity (SND) should be considered alongside congenital, traumatic, iatrogenic, inflammatory, infective, vascular, autoimmune, metabolic, drug-related and degenerative causes. Infective SND in the literature relate to leprosy, paediatric septal abscess and rarely cases of septal abscess in HIV. Vascular cause of SND includes Wegner's granulomatosis. Relapsing polychondritis is the only reported autoimmune cause of SND. Metabolic conditions such as fucosidosis, which is a lysosomal storage disorder causing structural abnormalities which resulted in SND. [24] Bacterial infections (tuberculosis, syphilis, diphtheria, rhinoscleroma, leprosy, actinomycosis), Fungal infections (aspergillosis, rhinomucormycosis), Sarcoidosis, foreign body granuloma, Wegener granulomatosis, polyarteritis nodosa, systemic lupus erythematosus, hypersensitivity angiitis, rheumatoid arthritis, dermatomyositis, Crohn's disease, Primary neoplasms (basal cell, squamous cell, adenoid cystic, and muco-epidermoid carcinomas; sarcomas; melanoma; small round blue cell tumor; esthesioneuroblastoma) and secondary neoplasms (metastases, lymphoma, leukemia, chloroma, cryoglobulinemia) are the causes for acquired lesions of the nasal septum. [25] The above verse denote various nasal deformities (विवृता, संवृता, जिह्मा and परिशुष्का) due to various underlying conditions such as nasal and paranasal tumours, septal deviations (जिह्मा), hemangiomas, lupus vulgaris and nasal atrophy (परिशुष्का) etc.

मुखं शब्दश्रवावोष्ठौ शुक्लश्यावातिलोहितौ। विकृत्या यस्य वा नीलौ न स रोगाद्विमुच्यते॥

Mukham --- vimuchyate [*Verse* 12] [3]

शुक्लत्वम् (*Shuklatvam*):

Signs traditionally used in the physical diagnosis of anemia are pallor of the conjunctivae, nail beds, face, palms, and palmar creases. conjunctival pallor has been documented to appear more frequently in patients with severe anemia, and hence may be more sensitive than other signs. [26]

श्यावत्वम् (*Shyavatvam*):

Hyperpigmentations (most of the lesions are brown or gray or black in colour) are a group of diseases that comprise both congenital and acquired forms secondary to cutaneous or systemic problems. Hyperpigmentation can be seen in various conditions

like melasma (‘*melas’* means black, condition of hypermelanosis, with brown to bluish gray stains on face and neck), Addison’s disease, hemochromatosis, post-inflammatory hyperpigmentation, periorbital pigmentation, dermatosis papulosa nigra, phytophotodermatoses, flagellate dermatosis, erythema dyschromicum perstans, cervical poikiloderma (Poikiloderma of Civatte), acanthosis nigricans, cutaneous amyloidosis and reticulated confluent dermatitis. [27]

अतिलोहितौ (*Atilohitau*):

Flushing is a subjective sensation of warmth accompanied by reddening of the skin anywhere on the body especially the face, neck, and upper torso. Cutaneous flushing is a common presenting complaint in endocrine disorders. The pathophysiology of flushing involves changes in cutaneous blood flow triggered by multiple intrinsic factors. Persistent flushing occurs as fixed facial erythema, telangiectasia and cyanotic tinge. Broad spectrum of conditions can cause cutaneous flushing like neuroendocrine disorders, benign and malignant entities including carcinoid syndrome, pheochromocytoma, Cushing syndrome, medullary thyroid cancer, and pancreatic neuroendocrine tumours. [28]

नीलत्वम् (*Neelatvam*):

Acrocyanosis is a functional peripheral vascular disorder and is much less common than other acrosyndromes (Raynauds phenomenon and erythromelalgia). Acrocyanosis is characterized by bluish discoloration of skin and mucous membrane due to diminished oxyhemoglobin. It may be due to central or local tissue oxygenation defects. Acrocyanosis is usually presents with coolness and violaceous dusky discolorations of hands, feet, ear, nose, lips and nipple. [29] Cyanosis is a pathologic condition that is characterized by a bluish discoloration of the skin or mucous membrane. The bluish hue is generally seen over the entire body surface and visible mucosa. The best area to assess for cyanosis is where the outer layer of the skin is very thin, and the blood supply is very generous such as the cheeks, nose, ears and oral mucosa. Central cyanosis suggests a cardiopulmonary disease. [30]

अस्थिश्वेता द्विजा यस्य पुष्पिताः पङ्क्तिसंवृताः। विकृत्या न स रोगं तं विहायारोग्यमश्नुते॥

Asthishweta --- arogyamashnute [*Verse* 13] [3]

White spot lesions (WSLs) are defined as “subsurface enamel porosity from carious demineralization” that presents as “a milky white opacity” (अस्थिश्वेता) when located on smooth surfaces. These are areas of local decalcification of enamel without cavity formation. WSLs are clinical manifestations of early enamel caries. These lesions are characterized by their opacity, mineral loss, and decrease of fluorescence radiance, when compared to healthy enamel surfaces. [31] Molar-incisor hypomineralization is an idiopathic condition characterized by severe hypomineralized enamel affecting incisors and permanent first molars. The enamel defects can vary from white (अस्थिश्वेता) to yellow to brownish areas. Dental fluorosis is characterized by symmetrical patterns of enamel discoloration resulting from sub-surface hypomineralization due to the ingestion of excessive amounts of fluoride. The clinical appearance may vary based on the severity from areas of enamel flecking to diffuse opaque mottling superimposed on chalky white (अस्थिश्वेता) or dark brown/black areas. Incipient dental carious lesions are associated with plaque accumulation and manifest as chalky white (अस्थिश्वेता) areas of discoloration secondary to demineralization. [32] Periodontal disease encompasses gingivitis (inflammation of gums) and periodontitis. Periodontitis develops over time with accumulation of dental plaque (पङ्क्तिसंवृताः), bacterial dysbiosis, formation of periodontal pockets (पङ्क्तिसंवृताः), gum recession, tissue destruction, and alveolar bone loss, halitosis (पुष्पिताः) and tooth loss. Existing data provide support for a positive association between periodontal disease and risk of oral, lung, and pancreatic cancers. [33]

स्तब्धा निश्चेतना गुर्वी कण्टकोपचिता भृशम्। श्यावा शुष्काऽथवा शूना प्रेतजिह्वा विसर्पिणी॥

Stabdhaa --- visarpini [*Verse* 14] [3]

स्तब्धा (*Stabdhaa*):

Pseudobulbar palsy (PBP) with slow spastic tongue movements, reduced gag reflex, brisk jaw and facial reflexes, are common findings. [34] Myotonia is usually mild, often involving the eyelids, hands, and tongue. Clinical myotonia manifests with painless muscle stiffness and pain. Myotonia is thought to be due to increased excitability of muscle fibers, leading to discharge of repetitive action potentials in response to stimulation. Electrical myotonia can also be seen in inflammatory myopathies, Pompe disease, hypothyroidism, myotubular myopathy, and chronic denervation. [35] Spastic tongue is one of the features of PBP. [36]

निश्चेतना (*Nishchetanaa*):

The chorda tympani (CT), a branch of the facial nerve (cranial nerve VII), carries taste information from fungiform papillae, while the lingual branch of the trigeminal nerve (cranial nerve V) carries pain, tactile, and temperature information from fungiform and filiform papillae in the same region. The two major symptoms following damage to taste-related nerves are loss of sensation and the emergence of phantom oral sensations. Taste loss can occur throughout the entire

mouth or in a specific region, it can affect a single taste quality or multiple ones, or it can target a specific portion of the dynamic range. It has been found that the rapid decline of anterior taste sensation occurs due to CT damage and posterior taste and tactile sensation occurs due to IX damage. [37]

गुर्वी (*Gurvee*):

Tongue pseudohypertrophy (enlargement of the tongue) or increased thickness of the tongue has been found in DMD (Duchenne muscular dystrophy) and ALS (Amyotrophic lateral sclerosis) patients. [38] The sensation of tongue swelling without objective evidence of any anatomical abnormality (subjective sensation of feeling heaviness of tongue?), combined with palatal weakness and dysphonia should warrant investigation of a local neurological cause such as MG (Myasthenia gravis). [39]

कण्टकोपचिता (*Kantakopachitaa*):

A fissured tongue is a malformation characterised by furrows or grooves on the dorsum of the tongue. Chronic trauma, vitamin deficiencies (Vitamin B2 and folic acid) and iron deficiency anaemia may have a role to play in the formation of fissured tongue. The clinician must be wary of various conditions like apthous ulcers, geographic tongue, lichenplanus, oral submucous fibrosis, candidiasis and hairy leukoplakia in HIV positive individuals etc while dealing with fissured tongue. [40] Lingua villosa nigra, also known as black hairy tongue, is characterized by a black discoloration and hairy texture on the dorsal surface of the tongue. The underlying mechanism for change is unknown. [41]

श्यावा (*Shyvaa*):

Pathologic pigmentation (brown, black, gray, blue and purple) can be classified into exogenous and endogenous based upon the cause. Exogenous pigmentation could be induced by drugs, tobacco/smoking, amalgam tattoo or heavy metals induced. And endogenous pigmentation can be associated with endocrine disorders (Addison's disease, diabetes and hyperthyroidism), syndromes (Peutz-Jegher syndrome, Macune Albright syndrome, neurofibromatosis, hemochromatosis and leopard syndrome), infections (HIV, tuberculosis and candidiasis), chronic irritation (post traumatic or post inflammatory like lichen planus and pemphigus), reactive (oral melanocytic macule and oral melanoacanthoma) or neoplastic (nevus and malignant melanoma). [42]

शुष्क (*Shushka*):

Sarcopenia may occur in the tongue as well as in other tissues. Sarcopenia of the lingual muscles would compromise oral function in the elderly. Atrophy of the tongue leads to malnutrition because of dysphagia. Dysphagia, tongue disuse syndrome, or malnutrition may affect tongue thickness, with subsequent worsening of malnutrition. Tongue thickness is related to nutritional status in the elderly. [43] Wasting of the tongue is seen in various LMN (lower motor neuron) syndromes. [44]

शूना (*Shoonaa*):

Lymphangioma, angioedema, allergic hemiglossitis, glossitis, Ludwig angina, angiomyxolipoma, amyloidosis, lingual abscess, orofacial granulomatosis, schwannoma of the tongue, cavernous hemangioma, tuberculosis of the tongue, carcinoma of the tongue, sarcoidosis, leukemia and various other endocrinal or inflammatory or infectious or neurological or neoplastic conditions may present with swelling or inflammation of the tongue.

विसर्पिणी (*Visarpinee*):

Cranial nerves 7 and 12 (CN VII and CN XII) innervate muscles of the lower face and the tongue, respectively. Unilateral lesions of UMN's (upper motor neurons) to CN VII or CN XII would manifest as a lower facial droop or tongue deviation away from the side of the lesion, respectively. [36] Intermittent or sustained, severe involuntary tongue protrusion in seen in patients with dystonic syndrome. Speech, swallowing, and breathing difficulties can be severe enough to be life threatening. Causes include neuroacanthocytosis, pantothenate kinase-associated neurodegeneration, Lesch-Nyhan syndrome, and postanoxic and tardive dystonia. The pathophysiology of intermittent severe tongue protrusion remains unknown. [45] Macroglossia is defined as a resting tongue that protrudes beyond the teeth or alveolar ridge. It may cause significant morbidity and causes a variety of signs and symptoms. Tongue protrusion in macrogloassia exposes the tongue to trauma. Primary macroglossia (muscular enlargement) can be caused by muscular hypertrophy and disproportionate growth of tongue and jaws; Secondary macroglossia can be seen in lymphangioma, hemangioma, cystic hygroma, Beckwith Wiedman syndrome, Hurlers syndrome, Mongolism, Acromegaly and Amyloidosis. [46]

दीर्घमुश्वस्य यो ह्रस्वं नरो निःश्वस्य ताम्यति। उपरुध्दायुषं ज्ञात्वा तं धीरः परिवर्जयेत्॥

Deerghamayushcha --- parivarjayet [*Verse* 15] [3]

Apneustic breathing is an abnormal breathing pattern results from injury to the upper pons by a stroke or trauma. It is characterized by regular deep inspirations (दीर्घमुश्वस्य) with an inspiratory pause followed by inadequate expiration (ह्रस्वं निःश्वस्य), seen in severe brain injury and carries a poor prognosis (उपरुध्दायुषं ज्ञात्वा). Biot respiratory pattern is characterized by regular deep respirations (दीर्घमुश्वस्य?) interspersed with periods of apnea (ह्रस्वं निःश्वस्य ?) and it is seen in damage to the pons

due to stroke, trauma, or uncal herniation. Kussmaul respirations were originally found in diabetic patients who were comatose and in the late stages of diabetic ketoacidosis. Kussmaul respirations are a deep, sighing respiratory pattern described as "air hunger." Kussmaul respiratory pattern occurs due to increased tidal volume with or without an increased respiratory rate. It is a form of hyperventilation. It occurs due to the stimulation of the respiratory center in the brain stem by low serum pH and to compensate for metabolic acidosis. In acidosis, initially the respiratory pattern is rapid and shallow, but as the acidosis progresses, the inspirations become deeper (दीर्घमुश्वस्य). Kussmaul respirations can be seen in acidosis, toxic ingestions (alcohol), uremia and also in lactic or ketoacidosis. Cheyne-Stokes is a pattern of crescendo-decrescendo respirations followed by a period of apnea and it is seen in patients with heart failure. [47]

हस्तौ पादौ च मन्ये च तालु चैवातिशीतलम्। भवत्यायुःक्षये क्रूरमथवाऽपि भवेन्मृदु॥

Hastau --- bhavenmrudu [*Verse* 16] [3]

In mild hypovolemic shock, the extremities become pale and cool (अतिशीतलम्). There may be sweating (भवेन्मृदु) in the forehead, hand and feet (हस्तौ पादौ च) due to adrenergic discharge. The patient feels thirsty and cold (अतिशीतलम). [48] Hypovolemia is defined as a decrease in the blood volume due to loss of blood, plasma and/or plasma water, ultimately causing a loss of intravascular content and resulting in a low tissue perfusion. It is often seen in case of severe dehydration (क्रूरम् भवेत्) or blood loss owing to trauma or surgery. If left untreated, this 'hypovolemic shock' can result in hypoxic tissue damage, organ failure, and ultimately, death. [49] The above verse denotes 'Hypovolemic shock'. The word 'अतिशीतलम्' denote circulatory collapse whereas 'मृदु', and '^{3}Ur' denotes sweating and dehydration at different stages and/or in different clinical presentations of 'Hypovolemic shock'.

घट्टयज्जानुना जानु पादावुद्यम्य पातयन्। योऽपास्यति मुहुर्वक्रमातुरो न स जीवति॥

Ghattayajjaanunaa --- na sa jeevati [*Verse* 17] [3]

Abnormal movements (chorea, clonus, dystonia, myoclonus, paroxysmal posturing, shivering, tics, tremors and non-convulsive status epilepticus) (घट्टयज्जानुना जानु, पादावुद्यम्य पातयन् and अपास्यति मुहुर्वक्रम्) are frequently encountered in patients with brain injury (anoxic, vascular, infectious, inflammatory, traumatic, toxic-metabolic, tumour related, seizures and degenerative) hospitalized in intensive care units (ICUs). Abnormal movements, alternatively described as dyskinesias or "paroxysmal" motor phenomena, often serve as valuable clues to the etiology of the injury and they have the potential to help guide treatment and prognostication. [50] Status epilepticus (SE) is defined as 'a seizure that persists for a sufficient length of time or is repeated frequently enough that recovery between attacks does not occur.' It is seen in acute infections, high fever, hypoglycemia, electrolyte imbalance, organ dysfunction, drug intoxication, poisoning, alcohol withdrawal, alcohol abuse, stroke, trauma, and hypertensive encephalopathy. [51] Disturbed psychomotor behaviour is another clinical feature of delirium, with unusually increased motor activity (घट्टयज्जानुना जानु, पादावुद्यम्य पातयन् and अपास्यति मुहुर्वक्रम्). In the hyperactive subtype of delirium, with increased psychomotor activity patients show features like hyper-vigilance, restlessness, agitation, aggression, mood lability, hallucinations and delusions. Behaviours are frequently disruptive or potentially harmful. [52]

दन्तैश्छिन्दन्नखाग्राणि नखैच्छिन्दञ्छिरोरुहन्। काष्टेन भूमिं विलिखन्न रोगात् परिमुच्यते॥

Dantai --- parimuchyate [*Verse* 18] [3]

Definition of Nail Biting (NB) is, "putting one or more fingers in the mouth and biting on nail with teeth" (दन्तैश्छिन्दन्नखाग्राणि) and it is also called onychophagia. NB is considered as a self-injurious behaviour such as pathological skin-picking or as a stereotypic movement disorder. Others believe that NB is a part of OCD spectrum. The trait which is accompanied with NB is oral aggression. NB is comorbid with various psychiatric conditions like attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), and separation anxiety disorder (SAD), enuresis, tic disorder, obsessive compulsive disorder (OCD), major depressive disorder (MDD), mental retardation (MR), pervasive developmental disorder (PDD) and Tourette's syndrome (TS). NB may be a symptom of a more complicated condition. [53] Trichotillomania (hair pulling disorder) is an often-debilitating psychiatric condition characterized by recurrent pulling out of one's own hair (नखैच्छिन्दञ्छिरोरुहन्), leading to hair loss and marked functional impairment. In DSM-5 (Diagnostic and statistical manual of mental disorders - 5th edition), trichotillomania was included in the chapter on Obsessive-Compulsive and Related Disorders with OCD, excoriation disorder, body dysmorphic disorder, and hoarding disorder. Trichotillomania occurs with a variety of other disorders such as MDD, anxiety, substance use disorders, OCD and TS. [54]

'काष्टेन भूमिं विलिखन्' denote various childhood movement disorders like motor stereotypies, chronic tic disorders and TS, compulsions, paroxsymal dyskinesias, functional (psychogenic) movement disorders, myoclonus dystonia syndrome, akathisia, Paediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcal infection (PANDAS), infantile gratification syndrome, shuddering attacks and hyperekplexia. Childhood motor stereotypies often consist of hand flapping or twisting, body rocking,

head banging, face or mouth stretching sometimes appearing as a marked grimace. There are several common types of movements including rocking, head banging and finger drumming. More complex themes include hand and arm flapping, waving and arm shaking. [55] The above verse indicates the pathology at cortico-striatal-thalamo cortical pathways and basal ganglia due to various conditions discussed above. The above verse may also denote 'Self injurious behaviour' (SIB) seen in TS.

दन्तान् खादति यो जाग्रदसाम्ना विरुदन् हसन्। विजानति न चेद्दुःखं न स रोगाद्विमुच्यते॥

Dantaan --- vimuchyate [*Verse* 19] [3]

Bruxism (gnashing of teeth) (दन्तान् खादति) is defined as, parafunctional grinding of teeth or an oral habit consisting of involuntary rhythmic or spasmodic non-functional gnashing, grinding or clenching of teeth". 'Awake bruxism' (यो जाग्रतो) is present when the individual is awake. Bruxism may be seen in various conditions like coma, cerebral palsy, icterus, Parkinson's disease, oromandibular dystonia, torus mandibularis, Rett syndrome, Down's syndrome and trauma. [56] Schizophrenic patients with TMD (Temporomandibular disorders) tend to have more dental attrition, abrasion, and erosion. This is because TMD are often associated with para functional activities, such as bruxism. Hypoalgesia in schizophrenia is very poorly understood, though it's being strongly associated with increased morbidity and mortality (न स रोगाद्विमुच्यते). It is speculated that hypoalgesia in schizophrenia is a nonspecific dulling response to pain (विजानति न चेद्दुःखम्), and it can be considered one of several manifestations of blunted response to the primary bodily sensations. This is due to the fact that people with schizophrenia often have a blunted response (विजानति न चेद्दुःखम्) not only to pain, but to pleasure and to basic emotions (असाम्ना विरुदन् हसन्). [57] The above verse denotes a condition of Schizophrenia with TMD.

मुहुर्हसन् मुहुः क्ष्वेडन् शय्यां पादेन हन्ति यः। उच्चैश्छिद्राणि विमृशन्नातुरो न स जीवति॥

Muhurhasan --- na sa jeevati [*Verse* 20] [3]

Movement disorders (Parkinson's disease - PD, dystonia, Tourette's syndrome - TS, restless legs syndrome - RLS, and akathisia) (शय्यां पादेन हन्ति यः) along with impaired motor control they are also associated with various behavioural (मुहुर्हसन् मुहुः क्ष्वेडन्), psychiatric (मुहुर्हसन् मुहुः क्ष्वेडन्), autonomic, and other non-motor symptoms. The well-known occurrence of sensory cueing through auditory, visual, or tactile inputs (उच्चैश्छिद्राणि विमृशन्) to overcome akinesia or motor freezing also emphasises the role of multimodal integration of sensory input in PD. In patients with Dystonia there is a well-recognised phenomenon termed as 'geste antagoniste' or a 'sensory trick' or 'alleviating manoeuvre' (उच्चैश्छिद्राणि विमृशन्). This manoeuvre could be motor (उच्चैश्छिद्राणि विमृशन्) or sensory in nature. Most patients who use alleviating manoeuvres obtain partial or complete improvement of their dystonic posture or movement. Examples of alleviating manoeuvres include a light touch to certain areas of the face, chin, or neck (उच्चैश्छिद्राणि विमृशन्) that allows a patient with cervical dystonia to bring the head into a primary (normal) position; or pulling on the upper eyelid or an eyebrow, wearing tinted lenses, talking, or singing that enables a patient with blepharospasm to keep the eyes open. Patients with generalised dystonia also use a variety of alleviating manoeuvres, such as placing their hands in their pockets, behind their neck or back, or on their hip; dancing or walking backwards; and placing objects on their head. Similar to dystonia, some patients have used alleviating manoeuvres to control tics. Patients with Tourette's syndrome had heightened subjective sensitivity to external stimuli to all five senses (उच्चैश्छिद्राणि विमृशन्) except taste. RLS (शय्यां पादेन हन्ति यः) is characterised by an unpleasant crawling sensation in the legs feels like 'urge to move', 'irritating', 'painful', 'restless', 'uncomfortable', and 'need to stretch'. These unpleasant sensations are relieved by movements of legs, which suggest that RLS, like tics, can be considered as a disorder of sensation relieved by movement. [58]

Patients having movement disorders (शय्यां पादेन हन्ति यः) with psychiatric symptoms (termed as basal ganglia encephalitis) have shown features like dystonia, parkinsonism, chorea, motor tics, psychosis (उच्चैश्छिद्राणि विमृशन्नातुरो), and emotional lability (मुहुर्हसन् मुहुः क्ष्वेडन्). [59] Lyme borreliosis (LB) is caused by *Borrelia burgdorferi* and other *Borrelia* species. There is a debate regarding the role of LB vs. other tick-borne diseases (TBD) in the pathogenesis of neuropsychiatric symptoms has been going on. A broad range of psychiatric findings associated with LB include paranoia, dementia, schizophrenia, bipolar disorder (rapid cycling and mood lability) (मुहुर्हसन् मुहुः क्ष्वेडन्), panic attacks, major depression, anorexia nervosa, and obsessive-compulsive disorder. Seizure disorders (complex partial and grand mal seizures) (शय्यां पादेन हन्ति यः) are more commonly associated with LB. Various features like depersonalization, derealization, capacity for visual imagery (उच्चैश्छिद्राणि विमृशन्नातुरो), vivid nightmares, illusions (auditory, visual), hallucinations (auditory, especially musical, visual, olfactory, sensory) (उच्चैश्छिद्राणि विमृशन्नातुरो), abrupt mood swings (मुहुर्हसन् मुहुः क्ष्वेडन्), hypervigilance, paranoia, compensatory compulsions, crying spells, depression, rapid cycling bipolar illness (मुहुर्हसन् मुहुः क्ष्वेडन्), obsessive compulsive disorder, tremor,

twitching, muscle tightness, myoclonic jerks, tics, TS (शय्यां पादेन हन्ति यः) and spasticity etc seen in 'Neuropsychiatric Lyme Borreliosis'. [60] The above verse may denote delirium (increased psychomotor activity or hyperactive subtype) also.

यैर्विन्दति पुरा भावैः समेतैः परमां रतिम्। तैरेवाराममाणस्य ग्लास्नोर्मरणमादिशेत॥
Yairvindati --- maranamaadishet [*Verse* 21] [3]
Major depressive disorder (MDD) is associated with increased percentages of invalidity, morbidity, and mortality (मरणमादिशेत्). [61] Depression is a consistent predictor of recurrent cardiac events and mortality in ACS (acute coronary syndrome) patients, but it has two core diagnostic criteria with distinct biological correlates, depressed mood and anhedonia. Major depression is a complex phenotype encompassing a wide range of symptoms like depressed mood (sadness and the report of feeling depressed) or anhedonia (markedly diminished interest or pleasure in all, or almost all, activities) (यैर्विन्दति पुरा भावैः समेतैः परमां रतिम् तैरेवाराममाणस्य ग्लानि). [62] Negative symptoms of schizophrenia are associated with high morbidity as they disturb the patient's emotions and behaviour. The most common negative symptoms are diminished emotional expression and avolition (decreased initiation of goal-directed behaviour), alogia and anhedonia (यैर्विन्दति पुरा भावैः समेतैः परमां रतिम् तैरेवाराममाणस्य ग्लानि).[63]

Cotard syndrome (CS) is a condition where the patient considers non-existence of almost everything including self. Though most commonly found in unipolar, bipolar depression and schizophrenia, it has also been found in organic conditions such as neurosyphilis, epilepsy, cerebrovascular accident, parietal lobe tumour, Parkinson's disease, and multiples sclerosis. It is characterized by mood congruent nihilistic delusions (यैर्विन्दति पुरा भावैः समेतैः परमां रतिम् तैरेवाराममाणस्य ग्लानि) like delusion of being dead, guilt, and immortality seen in patients of severe depressive episode. Patients are mostly found in advanced state, in severe psychomotor retardation with impairment in biological functions. CS is associated with other psychopathology such as Capgras delusion, lycanothropy and catatonia. [64] The above verse may also denote conditions like catatonia and organic mood disorder.

न बिभर्ति शिरो ग्रीवा न पृष्ठं भारमात्मनः। न हनू पिण्डमास्यस्थमातुरस्य मुमूर्षतः॥
Na bhibharti --- mumurshata [*Verse* 22] [3]
Many diseases (neuromuscular diseases, cancer, chronic inflammatory diseases, and acute critical illness) are associated with skeletal muscle atrophy, muscle weakness, and general muscle fatigue (न भारमात्मनः). This disease-induced muscle wasting and fatigue is associated with increased morbidity and mortality (मुमूर्षतः). Skeletal muscle atrophy and fatigue resulting from four different disease conditions: 1) Intensive care-induced skeletal muscle weakness 2) Cancer cachexia (sarcopenia) 3) Chronic inflammatory disease-induced muscle weakness (cancers, rheumatoid arthritis, chronic heart failure and chronic obstructive pulmonary disease - COPD) and 4) neurological disorders (multiple sclerosis). ICUAW (intensive care unit acquired weakness) is a condition in individuals admitted to the ICU with sepsis, chronic systemic inflammation, hyperglycemia (axonal neuropathy, myopathy and polyneuropathy), and/or multiple organ failure. [65]

The most common NMDs (neuromuscular disorders) are acquired peripheral neuropathies. Other acquired NMDs include amyotrophic lateral sclerosis (ALS), poliomyelitis, Guillain Barre syndrome (GBS), myasthenia gravis (MG), and polymyositis (PM). Hereditary NMDs are also quite common and include such disorders as spinal muscular atrophy (SMA), Charcot Marie Tooth disease (CMT), congenital myasthenia, and Duchenne muscular dystrophy (DMD). Bulbar involvement may be identified if the individual has difficulty chewing (n hnU), swallowing (पिण्डमास्यस्थमातुरस्य), or with speech articulation. The chief complaints with suspected NMDs include loss of strength, fatigue or decreasing endurance, falls, difficulty ascending stairs, exercise intolerance, episodic weakness, muscle cramps, focal wasting of muscle groups, breathing difficulties, or bulbar symptoms (पिण्डमास्यस्थमातुरस्य) relating to speech and swallowing. Posterior neck weakness is due to MG, PM, ALS, LMN (lower motor neuron) syndrome and focal myopathies of neck & paraspinous regions (न बिभर्ति शिरो ग्रीवा न पृष्ठं भारमात्मनः). [66]

सहसा ज्वरसंतापतृष्णा मूर्च्छा बलक्षयः। विश्लेषणं च सन्धीनां मुमूर्षोरुपजायते॥
Sahasaa --- upajaayate [*Verse* 23] [3]
A child with acute septic arthritis is typically unwell (संताप), with a fever (ज्वर). The joint is swollen, warm to the touch and acutely painful. The pain is exacerbated by movement, and the child holds the limb still. The position of most comfort varies with the joint, thus the septic hip is held in slight flexion, external rotation and abduction, the knee in slight flexion and the shoulder in internal rotation and abduction. These positions represent the position of maximum joint volume and therefore minimum pressure. Several children of acute septic arthritis have presented with 'pseudoparalysis' (विश्लेषणं च सन्धीनाम्), in which the affected limb was floppy (विश्लेषणं च सन्धीनाम्) and not actively used. If it was examined there did not appear to be significant pain. This may be due to the poor nutritional state of patients and reduction in immune response (बलक्षयः). [67] Sepsis is defined as systemic inflammatory response syndrome plus an infectious source. [68] The occurrence of clinical

findings in sepsis is usually insidious. They can occur in the form of fever (ज्वर), mental fog, temporary hypotension, decreasing urine amount, or unexplained thrombocytopenia. If not treated, respiratory and renal failure, coagulation disorders, and irremediable hypotension (मूर्च्छा) can develop. MODS (multi organ dysfunction syndrome) is the severe clinical manifestation of sepsis. The mortality rate is high despite new developments in sepsis treatment. The main target in septic shock (मूर्च्छा) treatment is regulating blood volume and providing sufficient tissue perfusion by a sufficient liquid treatment (indicates तृष्णा). [69]

गोसर्गे वदनाद्यस्य स्वेदः प्रच्यवते भृशम्। लेपज्वरोपतप्तस्य दुर्लभं तस्य जीवितम्॥
Gosargo --- jeevitam [*Verse* 24] [3]

Castleman's disease, Hodgkin's and non-Hodgkin's lymphoma, renal cell carcinoma, hepatocellular carcinoma, acute myeloid leukaemia, hairy cell leukaemia, glioblastoma multiforme, blast crisis of chronic myelogenous leukemia, ovarian cancer and atrial myxoma are the common neoplastic and paraneoplastic culprits of fever among cancers. Neoplastic fever has differing manifestations and significance depending on the underlying tumour type, and may hold prognostic value. [70] Flushing is a subjective sensation of warmth accompanied by reddening of the skin anywhere on the body especially the face (वदनाद्यस्य), neck, and upper torso. Cutaneous flushing is a common presenting complaint in endocrine disorders. The pathophysiology of flushing involves changes in cutaneous blood flow triggered by multiple intrinsic factors. A broad range of benign and malignant conditions are associated with flushing. Benign causes of flushing include rosacea, climacterium, fever (ज्वरोपतप्तस्य) and benign cutaneous flushing. The following causes of flushing are associated with increased morbidity and mortality: carcinoid syndrome, pheochromocytoma, mastocytosis, neuroendocrine tumors, anaphylaxis, medullary thyroid cancer, paraneoplastic syndrome, renal cell carcinoma, inborn errors of metabolism such as Fabry disease, and autonomic dysfunction. Flushing associated with sweating (wet flushes) (स्वेदः प्रच्यवते भृशम्) indicates autonomic hyperactivation. [28]

Pheochromocytoma and Paragangliomas (PPGLs) are catecholamine secreting neuroendocrine tumours. The clinical presentation is so variable that a PPGL has been described as "the great masquerader". The varied signs and symptoms of PPGLs mainly reflect the hemodynamic and metabolic actions of the catecholamines produced and secreted by the tumors. The presence of '3Ps triad' including headache (pain), palpitations and generalized inappropriate sweating (perspiration) (स्वेदः प्रच्यवते भृशम्) in patients with hypertension should lead to immediate suspicion for a PPGL. Fever of unknown origin (hypermetabolic state) (ज्वरोपतप्तस्य) and diaphoresis (स्वेदः प्रच्यवते भृशम्) can also be seen in PPGL. [71] Significant diurnal variations in plasma catecholamine levels have been observed. Both norepinephrine and epinephrine levels are peaked in late morning (*गोसर्गे*) and reached lowest levels at night during sleep. [72] The above verse may also indicate various fevers associated with complications.

नोपैति कण्ठमाहारो जिह्वा कण्ठमुपैति च। आयुष्यन्तं गते जन्तोर्बलं च परिहीयते॥
Nopaiti --- pariheeyate [*Verse* 25] [3]

Dysphagia (impaired swallowing) (नोपैति कण्ठमाहारो) is one of the most critical problems in patients with neuromuscular diseases (NMDs) and can be related to increased morbidity and mortality (आयुष्यन्तं गते). Early signs related to dysphagia, such as 'wet voice', silent aspiration, or loss of weight (जन्तोर्बलं च परिहीयते), are often discreet and unclear. Specific disorders such as bulbar and progressive respiratory muscle weakness, often associated with NMDs, disrupt the ability to swallow safely and efficiently (नोपैति कण्ठमाहारो) and may lead to severe complications, such as malnutrition (जन्तोर्बलं च परिहीयत), dehydration, aspiration pneumonia (due to जिह्वा कण्ठमुपैति च), and other pulmonary sequelae. Amyotrophic lateral sclerosis (ALS), Duchenne muscular dystrophy (DMD), Myotonic dystrophy type 1 (DM1), Inclusion body myositis (IBM), Myasthenia gravis (MG), Spinal muscular atrophy (SMA), Polymyositis / dermatomyositis (PM/DM), Friedreich's ataxia (FA) and spinal and bulbar muscular atrophy (SBMA) etc NMDs may present with dysphagia (नोपैति कण्ठमाहारो). Oropharyngeal dysphagia (नोपैति कण्ठमाहारो) can have dysphagia for liquids and solids in the different phases of swallowing. DMD patients may have difficulties with chewing and oropharyngeal transport of solid foods, as well as pharyngeal residue without aspiration is more common and is likely due to muscle weakness. In ALS, difficulties may likely be inability to hold bolus, reduced mastication, residue in the oral cavity and delayed swallow reflex (नोपैति कण्ठमाहारो). MTP (maximum tongue presesure) was significantly lower in the patients with ALS with reduced tongue function (जिह्वा कण्ठमुपैति च). [73]

शिरो विक्षिपते कृच्छान्मुह्यत्यिवा प्रपाणिकौ। ललाटस्रुप्रतस्वेदो मुमूर्षुश्चयुतबन्धनः॥
Shiro --- chyuta bandhana [*Verse* 26] [3]

Focal hyperhidrosis is commonly seen at axillary, palmar, plantar and craniofacial areas (ललाटस्रुप्रतस्वेदो). The causes and conditions associated with localized hyperhidrosis include primary or focal hyperhidrosis, unilateral circumscribed hyperhidrosis, hyperhidrosis associated with intrathoracic neoplasms, olfactory hyperhidrosis, gustatory hyperhidrosis, spinal cord injuries, and Frey syndrome. [74] Versive seizures are defined as a forced and involuntary turning of the head

(शिरो विक्षिपते) and in one direction with an associated neck extension resulting in a sustained unnatural position of both. Versive seizures appear earlier in seizures of frontal lobe origin as opposed to temporal lobe origin and can be the first sign of frontal lobe seizures. However, the reliability of the versive seizures requires clear differentiation between non-versive head turnings (which resemble natural movements) and epileptic versive seizures. Atonic seizures result in loss of postural tone with ensuing falls or head drop. Autonomic auras are subjective sensations suggesting possible autonomic alterations such as palpitations, sweating (ललाटस्रुप्रतस्वेदो), "goose bumps", etc. The symptomatogenic zone of most autonomic auras is most likely the insular cortex. [75] The first presentation of early onset benign occipital epilepsy, with prolonged loss of consciousness, can mimic an acute cerebral insult and cause considerable alarm. Interictal EEG abnormality and tonic head or eye deviation should prompt the diagnosis. Seizures with occipital spikes often begin with prominent autonomic and behavioural features, such as pallor, sweating (ललाटस्रुप्रतस्वेदो) and irritability. [76]

Excessive sweating (ललाटस्रुप्रतस्वेदो) is a common problem in persons with SCI (spinal cord injury). In most individuals, episodic hyperhidrosis is usually associated with other autonomic dysfunctions such as autonomic dysreflexia and orthostatic hypotension, or with post-traumatic syringomyelia. Most common symptoms are minimal/abolished sweating under the level of injury and profuse sweating over the level of injury. This is due to compensatory increase in sweat secretion (ललाटस्रुप्रतस्वेदो) above the level of injury due to the loss of sympathetic stimulation below the level of injury, which results in reduced sweat production. Patients with an acute complete SCI present with spinal shock associated with muscle paralysis (च्युतबन्धनः), reduced muscle tone (च्युतबन्धनः) and absent tendon reflexes (च्युतबन्धनः) under the level of injury. Spasticity (शिरो विक्षिपते कृच्छान्मुञ्चयित्वा) is usually established after 2-6 month post injury with exaggerated tendon reflexes, increased muscle tone, and muscle spasms in SCI. [77] A patient with mild spastic quadriparesis along with wasting and weakness of the small muscles of her hands (कृच्छान्मुञ्चयित्वा प्रपाणिकौ), excessive sweating in her face (ललाटस्रुप्रतस्वेदो), head and neck area found to be having 'Intramedullary spinal cord tumours'. Hyperhidrosis has been described in spinal cord injured patients and also in post-traumatic syringomyelia. [78] The above verse denotes various conditions like seizures, focal hyperhydrosis with some underlying neuropathy or neurological diseases, SCI at the level of cervical spine, syringomyelia (post traumatic), and intramedullary spinal cord tumours.

इमानि लिङ्गानि नरेषु बुद्धिमान् विभावयेतावहितो मुमूर्षुषु।
क्षणेन भूत्वा ह्युपयान्ति कानिचिन्नचाफलं लिङ्गमिहास्ति किञ्चन॥
Imaani --- kinchana [*Verse* 27-28] [3]

'क्षणेन भूत्वा ह्युपयान्ति' denotes that '*Arishta lakshanas'* may be momentary or transient in nature and they may disappear at any time after the manifestation. Hence, physician should be alert to identify them whenever they appear and keep the patient under observation for sufficient time to detect momentary or transient type of *Arishta lakshana's*. Death definitely follows after the manifestation of *Arishta lakshana's*. *Arishta lakshana's* are numerous, diverse and variable in nature.

CONCLUSION:

Most of the *arishta lakshana's* mentioned in this chapter are related to head and neck and they indicate imminent death within 3 to 6 days. *Arishta lakshana's* mentioned in this chapter denotes an underlying conditions like 'Grave's ophthalmopathy', 'Sensory and autonomic neuropathies', 'Saddle nose', 'Tumours of head and neck', 'Cutaneous flushing due to neuroendocrinal diseases', 'Dental flourosis', 'Rickets', 'Bulbar palsy', 'Neuromuscular disorders', 'Hypovolemic shock', 'Status epilepticus', 'Delirium', 'Trichotilliomania', 'Bruxism', 'Self injurious behaviours', 'Tourette's syndrome', 'Catatonia', 'Negative symptoms of schizophrenia', 'Septic shock', 'Oropharyngeal dysphagia' and 'Pheochromocytoma' etc which are fatal and having poor prognosis in present era also. This chapter also states that some of the *arishta lakshana's* are momentary or transient or fluctuate in nature and physician should be alert to detect them. Further research works are required to substantiate the clinical findings quoted in this chapter.

Table 1: Various *Arishta lakshanas* (Part-1)

Arishta lakshana	Relevant disease or pathology
अवाक्शिरा ---- चिकित्सितुम् *Avaakshira --- chikitsitum* (Ch. I. 8 / 3)	Shadow analysis; similar to radio-diagnosis or imaging studies; shadows represents internal body parts;
जटीभूतानि ---- भेषजेनोपपादयेत *Jatibhutani --- nopapadayet* (Ch. I. 8 / 4)	Blepharitis due to parasitic or fungal eye infections with secondary immunosupression; Autommine disease with ocular manifestations;
यस्य शूनानि ----- प्रेतस्तथैव सः *Yasya --- pretastathaiva sa* (Ch. I. 8 / 5)	Grave's ophthalmopathy;

भ्रुवोर्वा ---- परमुच्यते *Bhruvorva --- paramuchyate* (Ch. I. 8 / 6 & 7)	Seborrhoea in an immunocompromised patient; Carcinomas with an opportunistic scalp fungal infections or autonomic dysfunctions; Skull base tumours or metastatic skull tumours or brain tumours;
आयम्योत्पाटितान् ----- नातिवर्तते *Aayamya --- naativartate* (Ch. I. 8 / 8)	Syringomyelia; Pure neuritis form of Leprosy (PNL); DSDP (Diabetic symmetric distal polyneuropathy); Acute sensory polyneuritis in GBS (Guillain-Barre syndrome); Sensory neuropathies;
यस्य केशा ----- परिवर्जयेत् *Yasya kesha --- parivarjayet* (Ch. I. 8 / 9)	Seborrhoea in an immunocompromised patients; Seborrheic dermatitis in AIDS (Acquired immuno-deficiency syndrome);
ग्लायते ----- जानता *Glaayate --- jaanataa* (Ch. I. 8 / 10)	Saddle nose deformity in Leprosy, Syphilis, Wegeners granulomatosis; Rhinophyma; Maxillary or occult basal cell carcinomas; Nasal septal deviations;
अत्यर्थविवृता ----- न स जीवति *Atyartha --- na sa jeevati* (Ch. I. 8 / 11)	SND (saddle nose deformity); Nasal and paranasal carcinomas and benign tumours; Hemangiomas; Lupus vulgaris; Sarcodiosis; Granulomas;
मुखं ----- न स रोगाद्विमुच्यते *Mukham --- vimuchyate* (Ch. I. 8 / 12)	Anaemia; Hyperpigmentation; Cutaneous flushing in various neuroendocrine diseases; Cyanosis; Acrocyanosis;
अस्थिश्वेता ----- तं विद्यायारोग्यमश्नुते *Asthishweta --- arogyamashnute* (Ch. I. 8 / 13)	Dental fluorosis; Periodontitis in oral, lung and pancreatic carcinomas; Hypomeineralization or demineralization of enamel in carcinomas or metastases;
जिह्वा स्तब्धा (*Jihwa stabdha*) जिह्वा निश्चेतना (*Jihwa nishchetana*) जिह्वा गुर्वी & शूना (*Jihwa gurvi & shuna*) जिह्वा कण्टकोपचिता (*Jihwa kantakopachita*) जिह्वा श्यावा (*Jihwa shyaava*) जिह्वा शुष्का (*Jihwa shushka*) जिह्वा विसर्पिणी (*Jihwa visarpini*) (Ch. I. 8 / 14)	Pseuobulbar palsy; Myotonia; Progressive bulbar palsy; Pathology of cranial nerves V, VII and IX; DMD (Duchenne muscular dystrophy); ALS (Amyotrophic lateral sclerosis); MG (Myasthenia gravis); Macroglossia; Leukemia; Carcinomas; Inflammations; Fissured tongue in vitamin deficiencies; Black hairy tongue; Pathological pigmentation of tongue seen in Addison's disease; Neoplastic causes; Atrophy of the tongue in various LMN (lower motor neuron) syndromes; Pathology of cranial nerves VII & XII; LMN syndromes;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

Table 2: Various *Arishta lakshanas* (Part-2)

Arishta lakshana	Relevant disease or pathology
दीर्घमुश्वस्य ---- परिवर्जयेत् *Deergham ---- parivarjayet* (Ch. I. 8 / 15)	Abnormal breathing patterns like 'Apenustic', 'Cheyne-Stokes', 'Kussumaul' etc seen in cardio-pulmonary conditions, cerebrovascular accidents, metabolic acidosis and diabetic ketoacidiosis etc;
हस्तौ ----- भवेन्मृदु *Hastau ---- bhavenmrudu* (Ch. I. 8 / 16)	Hypovolemic shock;
घट्टयज्जानुना ---- न स जीवति *Ghattaya ---- jeevati* (Ch. I. 8 / 17)	Movement disorders seen in brain injuries; Status epilepticus (SE); Hyperactive subtype of Delirium;
दन्तैश्छिन्दन्नखाग्राणि ----- परिमुच्यते *Dantai ---- parimuchyate* (Ch. I. 8 / 18)	Nail biting, Trichotillomania and stereotypies seen in OCD spectrum disorders; Self injurious behaviours (SIBs) seen in Tourette's syndrome (TS);
दन्तान् ----- रोगाद्विमुच्यते *Dantaan ---- vimuchyate* (Ch. I. 8 / 19)	Awake bruxism seen in various neuropsychiatric conditions; TMDs (Temporomandibular disorders) seen in Schizophrenia;
मुहुर्हसन् ----- न स जीवति *Muhurhasan ---- na sa jeevati* (Ch. I. 8 / 20)	Movement disorders or dystonia with 'geste antagoniste' or 'sensory trick' or 'alleviating manoeuvre'; Restless legs syndrome (RLS); Neuropsychiatric Lyme borreliosis; Basal ganglia encephalitis;
यैर्विन्दति पुरा ----- मरणमादिशेत *Yairvindati ---- maranamaadishet* (Ch. I. 8 / 21)	Major depressive disorder (MDD); Negative symptoms of Schizophrenia; Cotard syndrome (CS); Catatonia; Bipolar mood disorder; Organic mood disorder;
न बिभर्ति ----- मुमूर्षतः *Na bhibharti ---- mumurshata* (Ch. I. 8 / 22)	NMDs (Neuromuscular disorders); LMN (lower motor neuron) syndromes;
सहसा ----- मुमूर्षोरुपजायते *Sahasaa ---- upajaayate* (Ch. I. 8 / 23)	Acute septic arthritis; Septic shock; SIRS (Systemic inflammatory response syndrome); MODS (Multi organ dysfunction syndrome);
गोसर्गे ----- तस्य जीवितम् *Gosargo ---- jeevitam* (Ch. I. 8 / 24)	Fever in neoplastic conditions; Cutaneous flushing in Neuroendocrinal diseases; Pheochromocytoma and Paraganglioma (PPGLs);

नोंपैति ----- च परिहीयते *Nopaiti ---- pariheeyate* (Ch. I. 8 / 25)	Neuromuscular disorders (NMDs); ALS (Amyotrophic lateral sclerosis); Oropharyngeal dysphagia;
शिरो विक्षिपते ----- मुमूर्षुश्चयुतबन्धनः *Shiro ---- chyuta bandhana* (Ch. I. 8 / 26)	Focal hyperhidrosis (acquired); Versive seizures; Frontal and occipital lobe seizures; Spinal cord injury (SCI); Syringomyelia; Intramedullary spinal cord tumours;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

REFERENCES:

1. Kumar VHS, Gopikrishna S. Understanding of arishta in present era with special reference to varna arishta. International Ayurvedic Medical Journal 2018; 6 (1): 163-168. Available from: http://www.iamj.in/posts/images/upload/162_168.pdf
2. Shekhawat V. Standards of scientific investigation: Logic and methodology of science in Charaka samhita. Indian Journal of History of Science 1984; 19 (3): 224-252. Available from: https://insa.nic.in/writereaddata/UpLoadedFiles/IJHS/Vol19_3_3_VShekhawat.pdf
3. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 8th chapter: Avaak shiraseeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 366-367.
4. Russo M, De Luca R, Naro A, Sciarrone F, Aragona B, Silvestri G, Manuli A, Bramanti A, Casella C, Bramanti P, Calabrò RS. Does body shadow improve the efficacy of virtual reality-based training with BTS NIRVANA? A pilot study. Medicine. 2017; 96 (38): (e8096). doi: 10.1097/MD.0000000000008096.
5. Iwashita Y, Stoica A, and Kurazume R. "Finding People by their Shadows: Aerial Surveillance Using Body Biometrics Extracted from Ground Video," 2012; Third International Conference on Emerging Security Technologies, Lisbon, 2012; p. 43-48.
6. Klotz SA, Penn CC, Negvesky GJ, Butrus SI. Fungal and parasitic infections of the eye. Clin Microbiol Rev. 2000; 13 (4): 662-685. doi: 10.1128/cmr.13.4.662-685.2000. PMID: 11023963; PMCID: PMC88956.
7. Rather PA, Hassan I. Human demodex mite: the versatile mite of dermatological importance. Indian J Dermatol. 2014; 59 (1): 60-66. doi: 10.4103/0019-5154.123498. PMID: 24470662; PMCID: PMC3884930.
8. Jackson WB. Blepharitis: Current strategies for diagnosis and management. Can J Ophtahlmol. 2008; 43 (2): 170-179. doi: 10.3129/i08-016
9. Jun B. Diagnostic Considerations in Patients Presenting with Transient Vision Loss. Mo Med. 2016; 113 (1): 63-67. PMID: 27039494; PMCID: PMC6139728.
10. Patel SJ, Lundy DC. Ocular manifestations of autoimmune disease. Am Fam Physician. 2002; 66 (6): 991–998. Available from: https://www.aafp.org/afp/2002/0915/p991.html
11. Bahn RS. Graves' ophthalmopathy. N Engl J Med. 2010; 362 (8): 726-738. doi: 10.1056/NEJMra0905750. PMID: 20181974; PMCID: PMC3902010.
12. David TJ, Osborne CM. Scalp hair pattern in mental sub normality. J Med Genet 1976; 13: 123-126. Available from: https://jmg.bmj.com/content/jmedgenet/13/2/123.full.pdf
13. Paul SP. Golden Spirals and Scalp Whorls: Nature's Own Design for Rapid Expansion. PLoS One. 2011; 11 (9): e0162026. doi: 10.1371/journal.pone.0162026. PMID: 27583520; PMCID: PMC5008782.
14. Grimalt R. A practical guide to scalp disorders. J Investg Dermtol Symp Proc. 2007; 12: 10–14. doi:10.1038/sj.jidsymp.5650048
15. Magee KR, Schneider RC. Syringomyelia: Loss of Deep-Pain Sensation with otherwise Normal Sensory Perception. JAMA. 1967; 200 (9): 795–797. doi:10.1001/jama.1967.03120220097024
16. Nathan PW. Reference of sensation at the spinal level. J Neurol Neurosurg Psychiat 1956; 19: 88-100. Available from: https://jnnp.bmj.com/content/jnnp/19/2/88.full.pdf
17. Nascimento OJM. Leprosy neuropathy: clinical presentations. Arquivos de Neuro-Psiquiatria. 2013; 71 (9B): 661-666. https://doi.org/10.1590/0004-282X20130146
18. Llewelyn JG. The Diabetic neuropathies: Types, diagnosis and management. J Neurol Neurosurg Psychiatry 2003; 74 (Suppl II): ii 15 – ii 19. doi: 10.1136/jnnp.74.suppl_2.ii15
19. Barohn RJ, Amato AA. Pattern-recognition approach to neuropathy and neuronopathy. Neurol Clin. 2013; 31 (2): 343-361. doi: 10.1016/j.ncl.2013.02.001. PMID: 23642713; PMCID: PMC3922643.
20. Wing ER, Ott BR. Unilateral Greater Occipital Nerve Compression Causing Scalp Numbness. R I Med J. 2015; 98 (3): 34-35. Available from: http://www.rimed.org/rimedicaljournal/2015/03/2015-34-case-wing.pdf
21. Dawson DM, Samules MA, Morris JS. Sensory form of acute polyneuritis. Neurology. 1988; 38 (11): 1728. doi: 10.1212/WNL.38.11.1728
22. Schreiber BE, Twigg S, Marais J, Keat A. Saddle-nose deformities in the rheumatology clinic. Ear Nose Throat J. 2014; 93 (4-5): E45-E47. Available from: https://www.ncbi.nlm.nih.gov/pubmed/24817241
23. Laun J, Gopman J, Elston JB, Harrington MA. Rhinophyma. Eplasty. 2015; 15: IC 25. PMID: 25987948; PMCID: PMC4426765.
24. Graham HE, Connolly C, Pahal GS, Stafford FW. 'Saddle nose' deformity caused by advanced squamous cell carcinoma of the nasal septum. BMJ Case Rep. 2014; 2014: bcr2013201765. doi: 10.1136/bcr-2013-201765. PMID: 25096649; PMCID: PMC4127758.
25. Valencia MP, Castillo M. Congenital and acquired lesions of the nasal septum: a practical guide for differential diagnosis. Radiographics. 2008; 28 (1): 205-223. Available from: https://pubs.rsna.org/doi/pdf/10.1148/rg.281075049
26. Sheth TN, Choudhry NK, Bowes M, Detsky AS. The relation of conjunctival pallor to the presence of anemia. J Gen Intern Med. 1997; 12 (2): 102-106. doi: 10.1046/j.1525-1497.1997.00014.x. PMID: 9051559; PMCID: PMC1497067.
27. Cestari TF, Dantas LP, Boza JC. Acquired hyperpigmentations. An Bras Dermatol. 2014; 89 (1): 11-25. doi: 10.1590/abd1806-4841.20142353. PMID: 24626644; PMCID: PMC3938350.
28. Hannah-Shmouni F, Stratakis CA, Koch CA. Flushing in (neuro) endocrinology. Rev Endocr Metab Disord. 2016; 17 (3): 373-380. doi: 10.1007/s11154-016-9394-8. PMID: 27873108; PMCID: PMC5161029.
29. Das S, Maiti A. Acrocyanosis: an overview. Indian J Dermatol. 2013; 58 (6): 417-420. doi: 10.4103/0019-5154.119946. PMID: 24249890; PMCID: PMC3827510.
30. Adeyinka A, Kondamudi NP. Cyanosis. [Updated 2019 Dec 30]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK482247/
31. Sundararaj D, Venkatachalapathy S, Tandon A, Pereira A. Critical evaluation of incidence and prevalence of white spot lesions during fixed orthodontic appliance treatment: A meta-analysis. J Int Soc Prev Community Dent. 2015; 5 (6): 433-439. doi: 10.4103/2231-0762.167719. PMID: 26759794; PMCID: PMC4697225.

32. Manuel ST, Abhishek P, Kundabala M. Etiology of tooth discoloration-a review. Etiology of tooth discoloration-a review. 2010; 18 (2): 56-63. Available from: http://eprints.manipal.edu/1970/1/21._Nig_Dent_J._2010_etio_discolo.pdf
33. Michaud DS, Fu Z, Shi J, Chung M. Periodontal Disease, Tooth Loss, and Cancer Risk. Epidemiol Rev. 2017; 39 (1): 49-58. doi: 10.1093/epirev/mxx006. PMID: 28449041; PMCID: PMC5868279.
34. Ling H. Clinical Approach to Progressive Supranuclear Palsy. J Mov Disord. 2016; 9 (1): 3-13. doi: 10.14802/jmd.15060. PMID: 26828211; PMCID: PMC4734991.
35. Hahn C, Salajegheh MK. Myotonic disorders: A review article. Iran J Neurol. 2016; 15 (1): 46-53. PMID: 27141276; PMCID: PMC4852070.
36. Emos MC, Agarwal S. Neuroanatomy, Upper Motor Neuron Lesion. [Updated 2018 Dec 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537305/
37. Snyder DJ, Bartoshuk LM. Oral sensory nerve damage: Causes and consequences. Rev Endocr Metab Disord. 2016; 17 (2): 149-158. doi: 10.1007/s11154-016-9377-9. PMID: 27511471; PMCID: PMC5033705.
38. Umemoto G. Tongue dysfunction in neurological and neuromuscular disorders: A narrative literature review. World Journal of Otorhinolaryngology. 2015; 5 (2): 58-64. doi: 10.5319/wjo.v5.i2.58
39. Marshal M, Mustafa M, Crowley P, McGovern R, Ahern E, Ragab I. Misdiagnosis of myasthenia gravis presenting with tongue and palatal weakness. Oxford Medical Case Reports. 2018; 2018 (8): 052. Available from: https://doi.org/10.1093/omcr/omy052
40. Chakraborty SK. FISSURED AND BURNING TONGUE. Med J Armed Forces India. 2000; 56 (1): 89. doi: 10.1016/S0377-1237(17)30112-0. PMID: 28790665; PMCID: PMC5531982.
41. Stringer LL, Zitella L. Hyperpigmentation of the tongue. J Adv Pract Oncol. 2014; 5 (1): 71-72. PMID: 25032039; PMCID: PMC4093463.
42. Sreeja C, Ramakrishnan K, Vijayalakshmi D, Devi M, Aesha I, Vijayabanu B. Oral pigmentation: A review. J Pharm Bioallied Sci. 2015; 7 (Suppl 2): S403-408. doi: 10.4103/0975-7406.163471. PMID: 26538887; PMCID: PMC4606629.
43. Tamura F, Kikutani T, Tohara T, Yoshida M, Yaegaki K. Tongue thickness relates to nutritional status in the elderly. Dysphagia. 2012; 27 (4): 556-561. doi: 10.1007/s00455-012-9407-z. PMID: 22538556; PMCID: PMC3528964.
44. Garg N, Park SB, Vucic S, et al. Differentiating lower motor neuron syndromes. J Neurol Neurosurg Psychiatry. 2016; 0: 1-10. doi:10.1136/jnnp2016-313526
45. Schneider SA, Aggarwal A, Bhatt M, Dupont E, Tisch S, Limousin P, Lee P, Quinn N, Bhatia KP. Severe tongue protrusion dystonia: clinical syndromes and possible treatment. Neurology. 2006; 67 (6): 940-943. doi: 10.1212/01.wnl.0000237446.06971.72
46. Nambiar BC, Prabhakar T, Manrai KP, Rawat GS. Macroglossia: A rare clinical entity. Med J Armed Forces India. 2001; 57 (2): 169-171. doi: 10.1016/S0377-1237(01)80147-7. PMID: 27407330; PMCID: PMC4925850.
47. Whited L, Graham DD. Abnormal Respirations. [Updated 2020 Feb 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470309/
48. Das S. A concise textbook of Surgery. Chapter 2 - Shock. 3rd edition. Calcutta: Dr S Das. p. 8-18.
49. Mandal M. Ideal resuscitation fluid in hypovolemia: The quest is on and miles to go! Int J Crit Illn Inj Sci. 2016; 6 (2): 54-55. doi: 10.4103/2229-5151.183020. PMID: 27308250; PMCID: PMC4901826.
50. Hannawi Y, Abers MS, Geocadin RG, Mirski MA. Abnormal movements in critical care patients with brain injury: a diagnostic approach. Crit Care. 2016; 20: 60. doi: 10.1186/s13054-016-1236-2. PMID: 26975183; PMCID: PMC4791928.
51. Cherian A, Thomas SV. Status epilepticus. Ann Indian Acad Neurol. 2009; 12 (3): 140-153. doi: 10.4103/0972-2327.56312. PMID: 20174493; PMCID: PMC2824929.
52. Martins S, Fernandes L. Delirium in elderly people: a review. Front Neurol. 2012; 3: 101. doi: 10.3389/fneur.2012.00101. PMID: 22723791; PMCID: PMC3377955.
53. Ghanizadeh A. Nail biting; etiology, consequences and management. Iran J Med Sci. 2011; 36 (2): 73-79. PMID: 23358880; PMCID: PMC3556753.
54. Grant JE, Chamberlain SR. Trichotillomania. Am J Psychiatry. 2016; 173 (9): 868-874. doi: 10.1176/appi.ajp.2016.15111432. PMID: 27581696; PMCID: PMC5328413.
55. Mills S, Hedderly T. A guide to childhood motor stereotypies, tic disorders and the Tourette's spectrum for the primary care practitioner. Ulster Med J. 2014; 83 (1): 22-30. PMID: 24757265; PMCID: PMC3992090.
56. Murali RV, Rangarajan P, Mounissamy A. Bruxism: Conceptual discussion and review. J Pharm Bioallied Sci. 2015; 7 (Suppl 1): S265-70. doi: 10.4103/0975-7406.155948. PMID: 26015729; PMCID: PMC4439689.
57. de Araújo AN, do Nascimento MA, de Sena EP, Baptista AF. Temporomandibular disorders in patients with schizophrenia using antipsychotic agents: a discussion paper. Drug Healthc Patient Saf. 2014; 6: 21-27. doi: 10.2147/DHPS.S57172. PMID: 24648768; PMCID: PMC3956479.
58. Patel N, Jankovic J, Hallett M. Sensory aspects of movement disorders. Lancet Neurol. 2014; 13 (1): 100-112. doi: 10.1016/S1474-4422(13)70213-8. PMID: 24331796; PMCID: PMC4759644.
59. Cummins G, Zandi M, Barker RA. Movement disorders and psychiatry: Five new things. Neurol Clin Pract. 2015; 5 (2): 143-149. doi: 10.1212/CPJ.0000000000000113. PMID: 29443187; PMCID: PMC5764446.
60. Bransfield RC. Neuropsychiatric Lyme Borreliosis: An Overview with a Focus on a Specialty Psychiatrist's Clinical Practice. Healthcare (Basel). 2018; 6 (3): 104. doi: 10.3390/healthcare6030104. PMID: 30149626; PMCID: PMC6165408.
61. Nizet L, Montana X, Lanquart JP, Loas G. Research into an Association between Anhedonia and Decreased REM Latency in Moderately to Severely Depressed Patients. Sleep Disord. 2018; 2018: 1636574. doi: 10.1155/2018/1636574. PMID: 30057824; PMCID: PMC6051023.
62. Davidson KW, Burg MM, Kronish IM, Shimbo D, Dettenborn L, Mehran R, Vorchheimer D, Clemow L, Schwartz JE, Lespérance F, Rieckmann N. Association of anhedonia with recurrent major adverse cardiac events and mortality 1 year after acute coronary syndrome. Arch Gen Psychiatry. 2010; 67 (5): 480-488. doi: 10.1001/archgenpsychiatry.2010.36. PMID: 20439829; PMCID: PMC3058237.
63. Patel KR, Cherian J, Gohil K, Atkinson D. Schizophrenia: overview and treatment options. P T. 2014; 39 (9): 638-645. PMID: 25210417; PMCID: PMC4159061.
64. Basu A, Singh P, Gupta R, Soni S. Cotard syndrome with catatonia: unique combination. Indian J Psychol Med. 2013; 35 (3): 314-316. doi: 10.4103/0253-7176.119490. PMID: 24249939; PMCID: PMC3821214.
65. Powers SK, Lynch GS, Murphy KT, Reid MB, Zijdewind I. Disease-Induced Skeletal Muscle Atrophy and Fatigue. Med Sci Sports Exerc. 2016; 48 (11): 2307-2319. doi: 10.1249/MSS.0000000000000975. PMID: 27128663; PMCID: PMC5069191.
66. McDonald CM. Clinical approach to the diagnostic evaluation of hereditary and acquired neuromuscular diseases. Phys Med Rehabil Clin N Am. 2012; 23 (3): 495-563. doi: 10.1016/j.pmr.2012.06.011. PMID: 22938875; PMCID: PMC3482409.

67. Lavy CB. Septic arthritis in Western and sub-Saharan African children - a review. Int Orthop. 2007; 31 (2): 137-144. doi: 10.1007/s00264-006-0169-9. PMID: 16741731; PMCID: PMC2267558.
68. Mahapatra S, Heffner AC. Septic Shock (Sepsis) [Updated 2019 Jun 4]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK430939/
69. Polat G, Ugan RA, Cadirci E, Halici Z. Sepsis and Septic Shock: Current Treatment Strategies and New Approaches. Eurasian J Med. 2017; 49 (1): 53-58. doi: 10.5152/eurasianjmed.2017.17062. PMID: 28416934; PMCID: PMC5389495.
70. Foggo V, Cavenagh J. Malignant causes of fever of unknown origin. Clin Med (Lond). 2015; 15 (3): 292-294. doi: 10.7861/clinmedicine.15-3-292. PMID: 26031983; PMCID: PMC4953117.
71. Pacak K, Tella SH. Pheochromocytoma and Paraganglioma. [Updated 2018 Jan 4]. In: Feingold KR, Anawalt B, Boyce A, et al., editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000. Available from: https://www.ncbi.nlm.nih.gov/books/NBK481899/
72. Prinz PN, Halter J, Benedetti C, Raskind M. Circadian variation of plasma catecholamines in young and old men: relation to rapid eye movement and slow wave sleep. J Clin Endocrinol Metab. 1979; 49 (2): 300-304. Available from: https://doi.org/10.1210/jcem-49-2-300
73. Audag N, Goubau C, Toussaint M, Reychler G. Screening and evaluation tools of dysphagia in adults with neuromuscular diseases: a systematic review. Ther Adv Chronic Dis. 2019; doi: 10.1177/2040622318821622. PMID: 30728931; PMCID: PMC6357297.
74. Stolman LP. Hyperhidrosis: medical and surgical treatment. Eplasty. 2008; 8: e22. PMID: 18488053; PMCID: PMC2344132.
75. Tufenkjian K, Lüders HO. Seizure semiology: its value and limitations in localizing the epileptogenic zone. J Clin Neurol. 2012; 8 (4): 243-250. doi: 10.3988/jcn.2012.8.4.243. PMID: 23323131; PMCID: PMC3540282.
76. Taylor I, Scheffer IE, Berkovic SF. Occipital epilepsies: identification of specific and newly recognized syndromes. Brain. 2003; 126 (4): 753-769. Available from: https://doi.org/10.1093/brain/awg080
77. Hagen EM. Acute complications of spinal cord injuries. World J Orthop. 2015; 6 (1): 17-23. doi: 10.5312/wjo.v6.i1.17. PMID: 25621207; PMCID: PMC4303786.
78. Chatterjee S, Ghosh K, Banerjee T. An intramedullary tumour with hyperhidrosis. Neurol India 2004; 52: 390-391. Available from:http://www.neurologyindia.com/text.asp?2004/52/3/390/12748

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YASYA SHYAVA NIMITTEEYAM OF CHARAKA INDRIYA STHANA - AN EXPLORATIVE STUDY

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REVIEW ARTICLE

YASYA SHYAVA NIMITTEEYAM OF *CHARAKA INDRIYA STHANA* - AN EXPLORATIVE STUDY

Abstract:
'*Charaka Samhita'* is the most revered and followed classical text of *Ayurveda* (an ancient Indian traditional system of medicine has been in practice since ages) considered as the treasure trove of the basic principles of *Ayurveda* and a rich literary source for academic, clinical and research activities. To estimate the prognosis of diseases *Ayurveda* has described '*Arishta lakshanas'* (fatal signs and symptoms which denotes imminent death). '*Indriya sthana*' (one among the 8 sections of *Charaka samhtia*) deals with prognostication of life expectancy or estimating survival time frames and alerts the physician towards early identification of fatal conditions based on '*Arishta lakshanas'. Indriya sthana* consists 12 chapters and '*Yasya shyava nimitteeyam indriyam*' is the 9th chapter of *Indriya sthana*. The present study is aimed to explore the various concepts mentioned in this chapter and also their prognostic significance in present era. Clinical examination of the sputum, faeces and semen are the unique features of this chapter. Assessing prognosis by giving meat soup (trial and error method), and *arishta lakshna's* related to various diseases like *Vatavyadhi* (neurological conditions), *Apasmara* (Epilepsy), *Kushtha* (skin diseases), *Rajayakshma* (tuberculosis / chronic debilitating respiratory tract disorders), *Gulma* (neoplastic conditions / acute abdomen), *Shopha* (oedema), *Udara* (ascites) and *Madhumeha* (diabetes) etc are mentioned in this chapter. Most of the conditions mentioned in this chapter are related to 'Cancer induced cachexia' (CIC), 'Shock', 'Delirium', 'Advanced stages of dementia' and other 'Chronic, debilitating conditions' commonly seen at the end stages of life. Further research works are required to substantiate the clinical findings quoted in this chapter.

Key Words: Cancer induced cachexia, Dementia, Delirium, Epilepsy, Neurological conditions, Shock

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INTRODUCTION:

'*Charaka Samhita'* is the most revered and followed classical text of *Ayurveda* (an ancient Indian traditional system of medicine has been in practice since ages) considered as the treasure trove of the basic principles of *Ayurveda* and a rich literary source for academic, clinical and research activities. '*Charaka Samhita*' is divided into eight sections (*sthana*) which are again divided into specific number of '*Adhyaya'* (chapters).[1]

'Indriya sthana' of '*Charaka samhita'* deals with the prognostic aspects and it consists 12 chapters. '*Yasya shyava nimitteeyam indriyam*' is the name of the 9th chapter of '*Indriya sthana*' of '*Charaka samhita*'. The present chapter deals with various '*Arishta lakshanas*' (fatal signs and symptoms commonly seen in dying patients and they denote imminent death) which leads to death. Clinical examination of the sputum, faeces and semen are the unique features of this chapter. Assessing prognosis by giving meat soup (trial and error method), and *arishta lakshna's* related to various diseases like *Vatavyadhi* (neurological diseases), *Apasmara* (Epilepsy), *Kushtha* (skin diseases), *Rajayakshma* (tuberculosis / chronic debilitating respiratory tract disorders), *Gulma* (neoplastic conditions / acute abdomen), *Shopha* (oedema), *Udara* (ascites) and *Madhumeha* (diabetes) etc are mentioned in this chapter. Most of the conditions mentioned in this chapter are related to CIC (cancer induced cachexia), shock, delirium, advanced stages of dementia and other chronic debilitating conditions commonly seen at the end stages of life. The present study is aimed to explore the various concepts mentioned in this chapter and also their prognostic significance in present era. [2]

MAIN CONTENTS (Table 1&2):

यस्य श्यावे परिध्वस्ते हरिते चापि दर्शने। आपन्ने व्याधिरन्ताय ज्ञेयस्तस्य विज्ञानता॥
Yasya shyaave --- vignaanataa [*Verse* 3] [2]

Alkaptonuria is an autosomal recessively inherited metabolic disorder (आपन्ने व्याधि) due to a deficiency in the enzyme homogentisic acid oxidase which results in the accumulation of homogentisic acid. Patient's wtih Alkaptonuria may present with arthritis (आपन्ने व्याधि) and a brownish black discoloration (श्यावे) in both eyes. Brownish black pigmented lesions can be seen in both nasal and temporal aspects of the sclera in inter palpebral region of both eyes. The scleral discoloration is referred to as Osler's sign, which usually starts around the third decade. [3] 'Nevus of Ota' is a dermal melanocytosis (light brown or deep slate gray or deep blue to brown pigmentation of eyes or skin) (श्यावे) may have delayed-onset and acquired. Nevus of Ota often occurs in association (आपन्ने व्याधि) with nevus of Ito and other cutaneous disorders and ocular diseases. Benign cutaneous and leptomeningeal conditions associated with nevus of Ota are phakomatosis pigmento-vasculari, nevus flammeus, Sturge-Weber syndrome, Takayasu disease, Klippel-Trenaunay syndrome, and

neurofibromatosis. The ocular complications associated with nevus of Ota are increased intraocular pressure and glaucoma. [4] Jaundice, also known as hyperbilirubinemia, is a yellow discoloration of the body tissue resulting from the accumulation of an excess of bilirubin. Sclerae have a high affinity for bilirubin due to their high elastin content. With further increase in serum bilirubin levels, the skin will progressively discolour ranging from lemon yellow to apple green (हरिते), especially if the process is long-standing and the green colour (हरिते) is due to biliverdin. [5] Various inflammations, infections, neoplasms (benign and carcinomatous) (intra orbital tumours), trauma, refractive errors, endocrinal pathologies (Grave's ophtahlmopathy), autoimmune diseases and neurological conditions (आपन्ने व्याधि) may distort (परिध्वस्ते) the shape, size and alignment of eye balls in orbits.

निःसंज्ञः परिशुष्कास्यः समृध्दो व्याधिभिश्च यः। उपरुध्दायुषं ज्ञात्वा तं धीरः परिवर्जयेत्॥

Nissangna --- parivarjayet [*Verse* 4] [2]

Delirium, stupor, and coma represent a broad spectrum of acute brain dysfunction and are associated with an impairment of consciousness (निःसंज्ञः). 'Stupor' is a condition of deep sleep or similar behavioural unresponsiveness from which the patient can be aroused only with vigorous and continuous stimulation whereas 'Coma' is a state of unresponsiveness (निःसंज्ञः) in which the patient cannot be aroused with any stimuli. Patients with severe dementia, poor functional status and having multiple comorbidities are highly vulnerable (समृध्दो व्याधिभिश्च यः). Various precipitating factors (समृध्दो व्याधिभिश्च यः) for Acute brain dysfunction are electrolyte abnormalities (hyponatremia, hypernatremia, hypercalcemia, and hypocalcemia), organ failure, Wernicke's encephalopathy, thyroid dysfunction, central nervous system insults (cerebrovascular accidents, intracerebral hemorrhage, epidural and subdural hematomas and subarachnoid hemorrhage), ethanol and benzodiazepine withdrawal, dehydration (परिशुष्कास्यः) and cardiovascular illnesses (congestive heart failure and acute myocardial infarction). [6]

हरिताश्च सिरा यस्य लोमकूपाश्च संवृताः। सोऽम्लाभिलाषी पुरुषः पित्तान्मरणमश्नुते॥

Haritashcha --- maranamashnute [*Verse* 5] [2]

Distended and engorged, green coloured veins (हरिताश्च सिरा यस्य) can be seen all over the enlarged abdomen (caput medusae) as a consequence of portal hypertension due to liver cirrhosis. [7] The systemic and splanchnic vasodilation seen in cirrhotic patients leads to reduced systemic vascular resistance, decreased effective blood volume (central hypovolemia), and hence decreased arterial blood pressure. In order to maintain blood pressure during systemic vasodilation, activation of effective sodium retention and vasoconstricting systems (लोमकूपाश्च संवृताः) (which may also leads to reduced sweating) [RAAS (renin–angiotensin–aldosterone system) and SNS (sympathetic nervous system)] are initiated in portal hypertension. [8] Liver is said to be the seat of '*Pitta'*. All the functions of '*Pitta'*, especially '*Ranjaka Pitta'* are attributed to liver. Liver and spleen are considered as, the root of '*Raktavahasrotas'*. Liver is very much important in all diseases concerned with '*Raktavaha* and *Pittavaha Srotas*'. [9] The above verse denotes 'Cirrhosis of liver' (*Yakruddalyudara*), [10] with poor prognosis (पित्तान्मरणमश्नुते).

शरीरान्ताश्च शोभन्ते शरीरं चोपशुष्यति। बलं च ह्रीयते यस्य राजयक्ष्मा हिनस्ति तम्॥

Shareeraanta --- hinasti tam [*Verse* 6] [2]

Secondary palmar hyperhidrosis (शरीरान्ताश्च शोभन्ते ?) can be seen in Tuberculosis. [11] The skin of the extremity can be cool, smooth, and shiny (शरीरान्ताश्च शोभन्ते) with hair loss, and nails can be thickened in severe PAD (peripheral artery disease). [12] Patients with TB have a significantly higher risk of developing PAD than patients without TB. [13] The traditional symptoms and signs of pulmonary tuberculosis are cough, sputum, haemoptysis, breathlessness, weight loss (बलं च ह्रीयते), anorexia, fever, malaise, wasting (शरीरं चोपशुष्यति), and terminal cachexia (शरीरं चोपशुष्यति). [14] The word 'शरीरान्ताश्च zae-Nte' denotes shiny or glossy extremities due to an underlying PAD in the patients of Tuberculosis.

अंसाभितापो हिक्का च छर्दनं शोणितस्य च। आनाहः पार्श्वशूलं च भवत्यन्ताय शोषिणः॥

Amsaabhitaapo --- shoshina [*Verse* 7] [2]

The traditional symptoms and signs of pulmonary tuberculosis are cough, sputum, haemoptysis (छर्दनं शोणितस्य च), breathlessness, weight loss, anorexia, fever, malaise, wasting, and terminal cachexia. [14] Persistent hiccup (हिक्का) can be seen in cavitating pulmonary tuberculosis patients. [15] Lower lung field tuberculosis affects the right lung more often and it is associating with pleuritic chest pain (पार्श्वशूलम्), haemoptysis (छर्दनं शोणितस्य च), early cavitation and hilar lymphadeonpathy. [16] "Rheumatism of the shoulder" (अंसाभितापो) has been found associated with pulmonary tuberculosis of the corresponding lung in many cases. [17] Cavitation or abscesses at the lower lobes of the lungs (atypical presentation of pulmonary tuberculosis) may irritate the diaphragm which can cause referral pain or burning sensation at shoulder region along with hiccoughs in the patients of pulmonary tuberculosis. The above verse may also indicate various other conditions like pleuritis, subphrenic abscesses, abdominal or extra pulmonary tuberculosis, secondary infection or opportunistic infections of lungs in an immune-compromised patient, perforation of peptic ulcer,

carcinomas of chest or abdomen and acute myocardial infarction in tuberculosis patients.

वातव्याधिरपस्मारी कुष्ठी शोफी तथोदरी। गुल्मी च मधुमेही च राजयक्ष्मी च यो नरः॥

अचिकित्स्या भवन्त्येते बलमांसक्षये सति। अन्येष्वपि विकारेषु तान् भिषक् परिवर्जयतेत॥

Vatavyadhi --- parivarjayet [*Verse* 8-9] [2]

Sarcopenia and cachexia are muscle wasting syndromes (बलमांसक्षये) associated with aging and with many chronic diseases such as congestive heart failure (CHF), diabetes, cancer, chronic obstructive pulmonary disease (COPD) and chronic kidney disease (CKD). [18] Cachexia is a complicated metabolic syndrome related to underlying illness and characterized by muscle mass loss with or without fat mass loss that is often associated with anorexia, an inflammatory process, insulin resistance, and increased protein turnover. Cachexia is seen in various chronic diseases, chronic infections and inflammatory diseases including AIDS. Significantly shorter survival in advanced cancer patients with cachexia (तान् भिषक् परिवर्जयतेत्) has been identified relative to those without cachexia. [19] Cachexia is usually reported as a complication of chronic diseases (अचिकित्स्या भवन्त्येते), rheumatoid arthritis, chronic hepatitis & cirrhosis and diabetes mellitus. A hypothesis has been proposed that independent of the individual chronic disease (वातव्याधि, अपस्मार, कुष्ठ, शोफ, उदर, गुल्म, मधुमेह and राजयक्ष्म), the wasting process follows a common (अन्येष्वपि विकारेषु) final metabolic pattern. This metabolic pattern usually relates to an advanced stage of the underlying disease and can best be summarized as an increased catabolic turnover and anabolic blunting. [20] Various descriptive terms used such as "cachexia", "anorexia", "sarcopenia", "malnutrition" and even "hypercatabolism" as synonyms by researchers and clinicians. [21] The above verse indicates the condition of Cachexia due to various underlying diseases.

विरेचनह्रुतानाहो यस्तृष्णानुगतो नरः। विरिक्तः पुनराध्माति यथा प्रेतस्तथैव सः॥

Virechana --- preta stathaiva sa [*Verse* 10] [2]

Gastrointestinal obstructions can occur anywhere along the gastrointestinal tract, from the esophagus to the rectum, but are most common in the small bowel. Bowel obstructions are more frequent in patients with colon cancer, gynecological cancers, melanoma, lung, breast, gastric, biliary, and pancreatic cancers. Bowel obstructions in cancer patients are due to benign causes also such as adhesions, fibrosis, volvulus, and intussusception. Malignant causes are secondary to intra luminal, intramural, or extrinsic tumours causing mechanical occlusion of the bowel lumen. The pathophysiology of obstructions involves a vicious cycle of distension (विरिक्तः पुनराध्माति) due to gas and non-absorbed secretions, followed by more fluid secretion, causing more distension in the bowel. In large-bowel obstruction, symptoms appear later with considerable distension and occasional paradoxical diarrhoea (विरेचनह्रुतानाहो) owing to bacterial overgrowth. There can also be functional obstructions causing the peristalsis of the bowel to malfunction. Diabetic neuropathy, constipation and medications might also contribute to bowel obstruction by slowing down intestinal transit or further blocking a stenosed area. [22] In patients with advanced cancers, MBO (Malignant bowel obstruction) is also associated with dehydration (तृष्णानुगतो नरः), renal dysfunction and ascites. [23] Abdominal bloating and distension can also occur in various "functional" conditions like irritable bowel syndrome (IBS), functional dyspepsia and premenstrual syndrome (PMS) etc; but the above verse denotes MBOs only based on mortality (यथा प्रेतस्तथैव सः).

पेयं पातुं न शक्नोति कण्ठस्य च मुखस्य च। उरसश्च विशुष्कत्वाद्यो नरो न स जीवति॥

Peyam --- na sa jeevati [*Verse* 11] [2]

Dysphagia is a disruption in the swallowing process during the preparatory transport of bolus from the oral cavity through the pharynx and the oesophagus to the stomach. Dysphagia can cause significant morbidity and mortality (नरो न स जीवति). The consequences of dysphagia include dehydration (विशुष्कत्वात्), malnourishment, starvation, aspiration pneumonia and airway obstruction. Patients with dysphagia of liquids (पेयं पातुं न शक्नोति) often have neuromuscular disorders or muscular weakness. Dysphagia of both solids and liquids is typical of oesophageal motility disorders.[24] Oropharyngeal dysphagia (पेयं पातुं न शक्नोति) is associated with numerous pathologies including, cerebrovascular accident (CVA; stroke), neurodegenerative diseases (e. g. Alzheimer's disease, Parkinson's disease and multiple sclerosis), certain advanced cancers, particularly head and neck, and trauma. A major complication of dysphagia is aspiration which results in morbidity (नरो न स जीवति) due to the development of pneumonia - referred to as aspiration pneumonia. Patients with dysphagia suffer with dehydration and excessive thirst (विशुष्कत्वात्). [25]

स्वरस्य दुर्बलीभावं हानिं च बलवर्णयोः। रोगवृध्दिमयुक्त्या च दृष्ट्वा मरणमादिशेत्॥

Swarasya --- marana maadishet [*Verse* 12] [2]

The cluster of potential signs and symptoms to be anticipated in the last days (मरणमादिशेत्) are pain, dyspnea, delirium, dysphagia, weakening of voice (स्वरस्य दुर्बलीभावम्), loss of appetite, incontinence (whether due to decreased ability to move despite support, or loss of consciousness), dry mouth, weakness, fatigue (हानिं च बलम्) and noisy upper airway secretions. [26] Dementia is a progressive (रोगवृध्दिम्), incurable illness (मरणमादिशेत्). In

patients with advanced dementia, the final year of life is characterized by a trajectory of persistently severe disability (हानिं च बलम्). Stage 7 on the Global Deterioration Scale (ranging from 1 to 7, with higher stages indicating worse dementia) provides a useful description of the features of advanced dementia, including profound memory deficits (e.g., inability to recognize family members), minimal verbal abilities (स्वरस्य दुर्बलीभावम्), inability to ambulate independently, inability to perform any activities of daily living, and urinary and fecal incontinence. Limited speech (fewer than 6 intelligible words) is one of the characteristic features in advanced dementia patients. [27] Delirium is prevalent at the end of life (मरणमादिशेत्), particularly during the final 24–48 hours. Delirium at this stage is not usually reversible (due to multi-organ failure). Delirium is one of the most common neuropsychiatric problems in patients with advanced cancer (रोगवृध्दिम्). [28] In the last days of life (मरणमादिशेत!), cancer patients often experience progressive functional decline and worsening symptom burden (रोगवृध्दिम्). Many symptoms such as anorexia-cachexia, dysphagia and delirium could impair oral intake. These, coupled with refractory cachexia, contribute to persistent weight loss and decreased quality of life (हानिं च बलवर्णयोः). [29] The above verse indicates advanced stages of cancers, dementia, delirium, Motor neuron disease (MND), Amyotrophic lateral sclerosis (ALS), Lower motor neuron syndrome (LMNs) and various other neuromuscular, neurodegenerative and chronic debilitating disorders.

ऊर्ध्वश्वासं गतोष्माणां शूलोपहतवंक्षणम्। शर्म चानधिगच्छन्तं बुध्दिमान् परिवर्जयेत्॥

Urdhwa shwasam --- parivarjayet [*Verse* 13] [2]

The signs and symptoms of sepsis are highly variable. Shortness of breath or tachypnea or hyperventilation (ऊर्ध्वश्वासम्), cold and clammy skin (गतोष्माणाम्), hypothermia (body temperature < 35° C), abdominal pain or distension or rigidity (surgical abdomen or gastrointestinal hemorrhage) (शूलोपहतवंक्षणम्), agitation or irritability (शर्म चानधिगच्छन्तम्) and DIC (disseminated intravascular coagulation) etc can be seen in sepsis or SIRS (systemic inflammatory response syndrome). [30] DIC is an acquired clinic-biological syndrome characterized by widespread activation of coagulation leading to fibrin deposition in the vasculature, organ dysfunction, consumption of clotting factors and platelets, and life-threatening haemorrhage. DIC is provoked by several underlying disorders (sepsis, cancer, trauma, and pregnancy complicated with eclampsia or other calamities). [31] Haemorrhage is the commonest presentation of DIC (causing hypothermia or गतोष्माणाम्). Acute renal failure occurs due to microvascular thrombosis in the kidney and reduced renal blood flow (शूलोपहतवंक्षणम् ?) due to hypotension. Acute tubular necrosis is common. Disseminated microvascular thrombosis in the brain leads to generalised cortical and brain stem dysfunction (brain hypoxia may cause restlessness or agitation or शर्म चानधिगच्छन्तम्) and causes impaired consciousness and coma. Thrombosis and haemorrhage in the lungs cause hypoxia and progressive respiratory failure identical to that seen in patients with the adult respiratory distress syndrome (ऊर्ध्वश्वासम्). [32] The above verse indicates acute abdomen or sepsis or DIC or intra-abdominal or intra pelvic haemorrhage due to various underlying conditions.

अपस्वरं भाषमाणं प्राप्तं मरणमात्मनः। श्रोतारं चापशब्दस्य दूरतः परिवर्जयेत्॥

Apaswaram --- parivarjayet [*Verse* 14] [2]

Language difficulties, frank confabulation, misnaming, word intrusion, repeating previously uttered word and inability to find a word or pronounce etc are commonly seen in the patients of Delirium. Disorganized thinking, manifested by incoherent speech and rambling or irrelevant conversation, or unclear or illogical flow of ideas etc (अपस्वरं भाषमाणम्) can also be seen in Delirium patients. [33] Patients with delirium may hear things which no one else can hear (auditory hallucinations) (श्रोतारं चापशब्दस्य). [34] Auditory hallucinations (श्रोतारं चापशब्दस्य) can also be seen in Alzheimer's dementia (AD). [35] Dementia is a set of symptoms that include memory difficulties, learning difficulties, speech and language difficulties, disorientation in time and space, difficulties in understanding and behavioural changes. People with dementia, among other signs, show problems of finding words (anomia), lack of understanding of the sentence and incoherent speech (अपस्वरं भाषमाणम्). [36] The above verse denotes advanced stages of dementia or delirium or organic psychosis.

यं नरं सहसा रोगो दुर्बलं परिमुञ्चति। संशयप्राप्तमात्रेयो जीवितं तस्य मन्यते॥

Yam naram --- tasya manyate [*Verse* 15] [2]

The common demyelinating diseases are multiple sclerosis (MS), acute disseminated encephalomyelitis (ADEM), progressive multifocal leucoencephalopathy (PML) and extrapontine myelinolysis (EPM). Demyelinating diseases of the CNS can be classified into several categories: demyelination due to inflammatory processes (MS, ADEM and Acute haemorrhagic leucoencephalitis - AHL), viral demyelination (PML, HIV infection, Subacute sclerosing panencephalitis), demyelination caused by acquired metabolic derangements (central pontine myelinolysis - CPM, EPM, chronic alcoholism and Marchiafava–Bignami disease), hypoxic–ischaemic forms of demyelination and demyelination caused by focal compression. MS pursues a relapsing and remitting course from the outset or can become progressive after initial remissions (परिमुञ्चति). The interval between relapses is variable (संशयप्राप्तम्). The latent phase between the first manifestation of MS and the first

relapse can be many years (परिमुञ्चति). Approximately 80% of patients with ADEM make a full recovery. Although ADEM is classically a monophasic disease, relapses have been reported (संशयप्राप्तम्) in 5–10% of cases (multiphasic disseminated encephalomyelitis). The principal viral demyelinating disease in humans is PML caused by the papovavirus, JC (John Cunningham) virus. Reactivation (संशयप्राप्तम्) of JC virus infection occurs under conditions of impaired cell-mediated immunity (दुर्बलम्) (after organ transplantation, in leukaemia, lymphoma and in AIDS). [37]

Relapsing polychondritis (RP) is an immune-mediated systemic disease characterized by auricular chondritis and polyarthritis, though many organs can be involved. Its onset is often insidious, with acute painful inflammatory crisis followed by spontaneous remission (सहसा रोगो परिमुञ्चति) of variable duration (संशयप्राप्तम्). With therapeutic delay RP can leads to an increased risk of permanent or life-threatening sequelae (संशयप्राप्तं जीवितं तस्य). [38] Systemic autoimmune diseases result from interactions between genes and environmental triggers that build up overtime until clinical symptoms appear. A complex interplay between innate and adaptive immunity lies at the core of most of these diseases. These diseases can be heterogeneous regarding the type of organs involved, clinical course and response to treatment. As many of these autoimmune diseases (ADs) follow a remitting (परिमुञ्चति) and relapsing course. [39] Various ADs are reported in the literature like Addison's disease, autoimmune hemolytic anemia, autoimmune vasculitis (Goodpasture's syndrome), bullous autoimmune disease (pemphigus), chronic active hepatitis (CAH), glomerulonephritis, Graves' disease, idiopathic thrombocytopenic purpura, multiple sclerosis, myasthenia gravis, myocarditis, pernicious anemia, polymyositis–dermatomyositis, primary biliary cirrhosis, relapsing polychondritis, rheumatic fever–heart disease, rheumatoid arthritis, Sjogren's disease, systemic lupus erythematosus, systemic sclerosis, thyroiditis, type 1 (insulin-dependent) diabetes mellitus (DM), uveitis, vitiligo, ankylosing spondylitis, celiac disease, Guillain-Barré disease (GBS), idiopathic fibrosing alveolitis (IFA), inflammatory bowel disease (IBD) (ulcerative colitis and Crohn's disease), juvenile idiopathic arthritis, polyendocrine syndrome and psoriasis. [40]

Vitamin B12 deficiency presents with progressive myelopathy which may sometimes appear to remit (परिमुञ्चति) and relapse. Relapses can also be seen in Transverse myelitis. [41] Persons with HIV associated secondary psychosis are reported to have a more variable course, and are more likely to have eventual remission (परिमुञ्चति) of their psychosis. Abrupt onset and relapsing-remitting pattern (परिमुञ्चति) of symptoms are found in Pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS). [42] Patients with refractory / relapsing anti-neutrophil cytoplasm antibody-associated vasculitis (AASV) have shown relapsing-remitting (परिमुञ्चति) pattern associated with complications like death, infection, malignancy and thyroid disorder (संशयप्राप्तं जीवितं तस्य). [43] The above verse indicates various conditions like, demyelinating disease, autoimmune disease, infectious diseases of CNS (viral), opportunistic infections in immunocompromised individuals, malaria, relapsing fevers, leishmaniasis, tuberculosis and neurocysticercosis etc.

अथ चेज्ज्ञातयस्तस्य याचेरन् प्रणिपाततः। रसेनाद्यादिति ब्रूयान्नास्मै दद्याद्विशोधनम्॥
मासेन चेन्न दृश्यते विशेषस्तस्य शोभनः। रसैश्चान्यैर्बहुविधैर्दुर्लभं तस्य जीवितम्॥
Atha chet --- tasya jeevitam [*Verse* 16-17] [2]

The above verse denotes a cachexia (cancer induced?) like condition which can't be reversed with protein and/or caloric intake and associated with poor prognosis. Cancer-induced cachexia (CIC) is commonly seen in advanced stage cancer, particularly those with gastrointestinal, pancreatic, thoracic and head and neck cancers. CIC has also been implicated in up to 20% of cancer-related deaths. Cachexia results due to an altered metabolic state as the result of tumour-derived factors, loss of anabolic stimuli, and due to an increase in catabolic processes. Unlike starvation, where metabolism slows down to conserve body mass, CIC cannot be reversed by feeding alone (चेन्न दृश्यते विशेषस्तस्य शोभनः). There is no accepted therapy for CIC which has been leading to a feeling of helplessness by both the patient and treating oncologist as weight continues to drop. Therapeutic options for CIC are limited. It is important to understand that significant increases in caloric intake (रसेनाद्यादिति ब्रूयान्नास्मै), and use of enteral nutrition and parenteral nutrition, are not always beneficial in CIC patients (रसैश्चान्यैर्बहुविधैर्दुर्लभं तस्य जीवितम्). Often caretakers and patients believe that increased caloric intake (रसैश्चान्यैर्बहुविधैः) will help the patient to "fight the cancer". In reality, the scientific data behind nutrition support in cancer care remains conflicting. Short supplementation periods (मासेन) have failed to show efficacy in patients who are in advanced stages of cancer when it is unlikely that any type of intervention would be of benefit (रसैश्चान्यैर्बहुविधैर्दुर्लभं तस्य जीवितम्). [44]

निष्ठ्यूतं च पुरीषं च रेतश्चाम्भसि मज्जति। यस्य तस्यायुषः प्राप्तमन्तमाहुर्मनीषिणः॥
Nishtyutam --- maneeshina [*Verse* 18] [2]

निष्ठ्यूतं अम्भसि मज्जति *(Nishtyutam ambhasi majjati)*:

Chronic airway diseases like cystic fibrosis, chronic bronchitis, asthma, diffuse panbronchiolitis, and

bronchiectasis are all associated with chronic inflammation. The airway mucosa responds to infection and inflammation in part by surface mucous (goblet) cell and submucosal gland hyperplasia and hypertrophy with mucus hypersecretion. Products of inflammation including neutrophil derived DNA and filamentous actin, effete cells, bacteria, and cell debris all contribute to mucus purulence (अम्भसि मज्जति) and, when this is expectorated it is called sputum (निष्ठ्यूतम्). These airway diseases each are associated with the production of mucus and sputum with characteristic composition, polymer structure, and biophysical properties (निष्ठ्यूतं च अम्भसि मज्जति). These properties change with the progress of the disease making it possible to use sputum analysis to identify the potential cause and severity of airway diseases (यस्य तस्यायुषः प्राप्तमन्तमाहु). [45] Carcinomas, tuberculosis, cavitary pulmonary diseases, lung abscesses and various infectious diseases can leads to the increased specific gravity of sputum (due to the presence of pus cells, cell debris, bacteria and various other abnormal components of sputum) (निष्ठ्यूतं च अम्भसि मज्जति).

पुरीषं अम्भसि मज्जति (*Purisham ambhasi majjati*):

Faecal output in healthy individuals was 1.20 defecations per 24 hr period and the main factor affecting faecal mass was the fiber intake. Faecal wet mass values were increased (अम्भसि मज्जति) due to high fiber intakes in comparison to values found in low fiber intakes. Faeces were composed of 74.6% water. Bacterial biomass is the major component (25–54% of dry solids) of the organic fraction of the faeces. Undigested carbohydrate, fiber, protein, and fat comprise the remainder and the amounts depend on diet and diarrhoea prevalence in the population. The inorganic component of the faeces is primarily undigested dietary elements that also depend on dietary supply. [46] Stool should also be macroscopically checked in terms of colour, consistency, quantity, shape, odour and mucus. The presence of copious mucus or bloody mucus in stool is abnormal. By using 'The Modified Bristol visual stool scale', stool consistency can be evaluated.[47] Constipation (hard stool) is a significant problem found in many cancer patients (यस्य तस्यायुषः प्राप्तमन्तमाहु). [48] Various abnormal components of stool may increase the specific gravity or hardness or weight of the stool (अम्भसि मज्जति) in vide variety of conditions like pancreatic or intestinal diseases, carcinomas of gastrointestinal tract, ulcerative colitis and megacolon etc.

रेतसः अम्भसि मज्जति (*Retasa ambhasi majjati*):

High white blood cell (WBC) concentrations within semen are an indicator of infection; this condition, marked by pus in the semen, is termed pyospermia.[49] Hematospermia, also known as hemospermia, is a potentially alarming occurrence. The definition of hematospermia is presence of blood in the seminal fluid. Recurring or chronic hematospermia, in particular, may result from a variety of conditions like prostatitis, polyps, cysts, stones, telangiectasias, varices, carcinoma, sarcoma, malacoplakia, condylomas, hemangiomas, strictures, utricular cysts, infections, trauma, lymphoma, leukemia, epididymo-orchitis, testicular tumours and idiopathic.[50] Various abnormal components of semen like blood and pus cells etc may increase the specific gravity of semen and leads to 'अम्भसि मज्जति'. The above verse indicates various underlying fatal conditions increasing the specific gravity of sputum or faeces or semen.

निष्ठ्यूते यस्य दृश्यन्ते वर्णा बहुविधा पृथक्। तच्च सीदत्यपः प्राप्य न स जीवितुमर्हति॥

Nishtyute --- jeevitumarhati [*Verse* 19] [2]

Yellowish or greenish sputum (निष्ठ्यूते यस्य दृश्यन्ते वर्णा बहुविधा पृथक्) may be seen in viral bronchitis. Sputum production in viral airway infections may be clear, white, or even tinged with blood. It has been shown that a yellowish or greenish sputum colour is often related to the bacterial load of patients suffering from COPD exacerbation or patients hospitalized due to respiratory conditions. Bacterial yield from sputum colours green, yellow-green, yellow, and rust (निष्ठ्यूते यस्य दृश्यन्ते वर्णा बहुविधा पृथक्) was higher than the yield from cream, white, or clear samples. [51] During a lower respiratory tract infection the sputum is usually discoloured. Typically, it is a darker green in the early stages and gradually lightens as the infection improves with time and treatment. [52] Black-pigmented sputum, also called "melanoptysis," is a symptom that may be observed in certain pathologies such us coal workers' pneumoconiosis (anthracosis). The cavitation and liquefaction of a fibrosis mass by an infectious process (tuberculosis, infections by anaerobes, etc.) or by ischemic necrosis (न स जीवितुमर्हति) may cause expectoration of a blackish secretion. [53] Chronic expectoration of large amounts of purulent and foul-smelling sputum is strongly denotes bronchiectasis. Sudden production sputum in a febrile patient indicates a lung abscess. Rust-coloured purulent sputum is seen in pneumococcal pneumonia; currant jelly and sticky sputum seen in klebsiella pneumonia and blood-tinged foamy sputum (निष्ठ्यूते यस्य दृश्यन्ते वर्णा बहुविधा पृथक्) is found in pulmonary oedema. [54]

पित्तमूष्मानुगं यस्य शङ्खौ प्राप्य विमूर्छति। स रोगः शङ्खको नाम्ना त्रिरात्राध्दन्ति जीवितम्॥

Pittam --- jeevitam [*Verse* 20] [2]

Inflammatory pseudo tumour (IP) is a clinically invasive, benign mass lesion of unknown etiology. It has been recognized by various names like plasma cell granuloma, inflammatory myofibroblastic tumour, histiocytoma complex, xanthomatous pseudo tumour, fibrous xanthoma, and inflammatory

myofibrohistiocytic proliferation. IP of the temporal bone (शङ्खौ प्राप्य) is uncommon but remains important given its recurrent and destructive natures. Temporal pseudo tumour appears to have a more aggressive (पित्तमूष्मानुगम्) and unpredictable courses than IPs in other body sites. IPs occurring in the middle ear and mastoid may erode into the surrounding dura, sigmoid sinus, tentorium, and even brain parenchyma. Intra temporal extensions to the otic capsule, facial nerve, petrous apex, and internal auditory canal are common. [55] Swelling in the temporal region (शङ्खौ प्राप्य) with pain and shows an increase in size or becomes cosmetically disfiguring can be seen in a variety of conditions such as lipoma, schwannoma, dermoid, mesenchymal angiolipoma, and spindle cell hemangio-endothelioma; vascular malformations such as cavernous hemangiomas and arterio-venous malformations (AVMs); and malignant lesions such as liposarcomas and angiosarcomas. Occasionally, extracranial extensions of intracranial meningiomas / hemangiopericytomas or osteoma of the calvarium can present in a similar fashion. Enlarged lymph nodes, myositis ossificans, and temporal arteritis also show similar features. [56]

Giant cell arteritis (GCA) is the most common systemic vasculitis (पित्तमूष्मानुगम्) in persons aged 50 and above. The typical symptoms of new-onset GCA are bitemporal headaches, jaw claudiacation, scalp tenderness, visual disturbances, systemic symptoms such as fever and weight loss, and polymyalgia. GCA, if untreated, progresses to involve the aorta and its collateral branches, leading to various complications (हन्ति जीवितम्). Late diagnosis and treatment can have serious consequences (हन्ति जीवितम्), including irreversible loss of visual function. [57] Patients with GCA risk a number of disease-related complications including blindness and aortic aneurysms. GCA patients have an increased risk of death due (हन्ति जीवितम्) to circulatory diseases and infections, but a decreased risk of death due to cancer over time. Increased vascular risk associated with GCA has also been reported by others and includes cardiovascular disease, thromboembolic disease, and LV (large vessel) complications (हन्ति जीवितम्). [58]

सफेनं रुधिरं यस्य मुहुरास्यात् प्रसिच्यते। शूलैश्च तुद्यते कुक्षिः प्रत्याख्येय स्तथाविधः॥

Saphenam --- stadha vidhi [*Verse* 21] [2]

Hemoptysis (सफेनं रुधिरम्) is defined as the expectoration of blood, alone or mixed with mucus, from the lower respiratory tract. It occurs in chronic lung disease, bronchitis, pneumonia, tuberculosis, cystic fibrosis, pulmonary embolism and bronchial or lung carcinoma. Hemoptysis is a potentially life-threatening emergency. True hemoptysis, with the source of bleeding in the airways or lungs, must be distinguished from pseudohemoptysis, where the blood originates from the upper gastrointestinal tract or the upper respiratory tract (mouth, nose, or throat). Massive hemoptysis is fatal in 50-100% of cases (प्रत्याख्येय स्तथाविधः). Careful history taking and inspection of the nasopharynx should determine whether the bleeding is coming from the respiratory tract (alkaline, bright red, foamy blood, breathing difficulty, sensation of warmth in the thorax) or from the gastrointestinal tract [hematinized blood, acid pH, food particles, abdominal pain (शूलैश्च तुद्यते कुक्षिः) and nausea]. [59] The physician evaluating hemoptysis must be convinced that the bleeding is not of gastrointestinal origin. A history of nausea, vomiting, heartburn, and abdominal pain (शूलैश्च तुद्यते कुक्षिः) may be helpful, but occasionally the differential diagnosis is difficult and requires either direct observation of the patient's hemoptysis. The patient coughs up bright red blood or blood clots (as in carcinoma of the lung, tuberculosis, pulmonary embolism); blood-streaked, purulent sputum (as in bronchitis, bronchiectasis, or pneumonia); blood-tinged, white, frothy sputum (सफेनं रुधिरम्) (as in congestive heart failure); and foul-smelling, bloody sputum (in anaerobic lung abscess). [60] In the above verse the word 'सफेनं रुधिरम्' denotes frothy expectoration of blood or 'hemoptysis' originating from respiratory tract and in the same verse the word 'शूलैश्च तुद्यते कुक्षिः' denotes abdominal pain along with expectoration of blood which indicates the source of blood from upper gastrointestinal tract. The above verse may denote a condition of hemoptysis with an underlying disease of respiratory tract and 'शूलैश्च तुद्यते कुक्षिः' indicates abdominal pain due to continuous cough; or it may indicate a condition of 'pseudohemoptysis', where the blood originates from the upper gastrointestinal tract or the upper respiratory tract (mouth, nose, or throat) associated with abdominal pain.

बलमांसक्षयस्तीव्रो रोगवृध्दिररोचकः। यस्यातुरस्य लक्ष्यन्ते त्रीन् पक्षान्न स जीवति॥

Bala maamsa --- sa jeevati [*Verse* 22] [2]

Nutritional deficits include weight loss, malnutrition (बलमांसक्षयस्तीव्रो) and anorexia-cachexia are seen in the patients of lung cancer. Anorexia-Cachexia is a complex, seen in many solid tumours in late stage disease. Cachexia related to cancer occurs in most patients with advanced lung cancer and cancer anorexia (the loss of appetite) (अरोचकः) is a common symptom of cachexia. Cancer- related anorexia (अरोचकः) and cancer-related cachexia are distinct syndromes but are often intertwined in progressive disease (रोगवृध्दि). The characteristics of anorexia are common among many patients with serious illnesses (न स जीवति) such as

lung cancer, acquired immune deficiency syndrome (AIDS) and other chronic diseases. [61]

विज्ञानानि मनुष्याणां मरणे प्रत्युपस्थिते। भवन्त्येतानि संपश्येदन्यान्येवंविधानि च॥
तानि सर्वाणि लक्ष्यन्ते न तु सर्वाणि मानवम्। विशन्ति विनशिष्यन्तं तस्माद्वोध्यानि सर्वतः॥

Vignaanaani --- sarvata [*Verse* 23-24] [2]

The above verse denotes the importance of being vigilant for the physician to detect various *arishta lakshna's* shown by the patient on death bed (मरणे प्रत्युपस्थिते) as explained in this chapter (and those which are not mentioned in this chapter also). This verse indicates that *arishta lakshana's* are infinite, variable (qualitatively and quantitatively), and also individualized or personalized. The *arishta lakshana's* mentioned in this chapter are only for guidance and physician should improve his/her skills to detect or identify various other *arishta lakshna's* also which are not mentioned in the text (पश्येदन्यान्येवंविधानि च) by observing the patients vigilantly.

CONCLUSION:

Aristhta lakshana's related to the classical *Ayurvedic* diseases like '*Vatavyadhi'*, '*Apasmara'*, '*Udara'* etc have been mentioned for the first time in *Indriya sthana* in the current chapter. Most of the conditions mentioned in this chapter are related to CIC (cancer induced cachexia), shock, delirium, advanced stages of dementia and other chronic debilitating conditions commonly seen at the end stages of life. 'संशयप्राप्तं जीवितं तस्य' indicates that there may be some conditions which are having fluctuating or episodic or relapsing-remitting patterns or latent disease course and cause great confusion to the physician. This word also indicates that course of *Arishta lakshnas* is variable in nature (they may disappear spontaneously at any time after their manifestation). Examination of *Arishta lakshanas* can be done by using '*Upashaya and Anupashaya pariksha*' (trial and error method) with '*Mamsa rasa'* (meat soup) in cachexia patients. Negative response with '*Mamsa rasa'* denotes that the underlying pathology is irreversible and having progressive nature seen in 'CIC'. Clinical or macroscopic examination of sputum, stool and semen with 'Float on water test' is unique contribution of this chapter in detecting *Arishta lakshana's*. Standardization of '*Upashaya & Anupashaya pariksha*' with '*Mamsa rasa*' and 'float on water test' is required. Individual variability of *Arishta lakshanas* is also mentioned at the end of the chapter. 'त्रिरात्राध्दन्ति जीवितम्' and 'त्रीन् पक्षान्न स जीवति' etc denotes life expectancy at the end stages of life based on '*Arishta lakshanas'*. Now a days to evaluate life expectancy and to predict prognosis various instruments, scales, calculators, questionnaires, computer based programmes, statistical algorithms etc are used such as 'ePrognosis calculators', 'Questionnaires', 'Interactive online tools', 'Risk assessment tools and prognosis scores', 'Prognostic scales', 'Clinical calculators', 'Mortality indices', 'Prognostic scoring algorithms', 'Risk score assessments', and various other questionnaires or scales in different diseases or conditions. All these technological advances and measuring tools should be implemented and integrated in Ayurvedic research protocols to standardize '*Arishta lakshanas'*.

Table 1: Various *Arishta lakshanas* (Part-1)

Arishta lakshana	Relevant disease or pathology
यस्य श्यावे ---- विज्ञानता *Yasya shyave -- vignaanata* (Ch. I. 9 / 3)	Alkaptonuria; Nevus of Ota; Jaundice due to various underlying pathological conditions;
निःसंज्ञः परिशुष्कास्यः ---- धीरः परिवर्जयेत् *Nissangna -- parivarjayet* (Ch. I. 9 / 4)	Acute brain dysfunction; Coma; Delirium; Hypovolemic shock;
हरिताश्च सिरा ----- पित्तान्मरणमश्नुते *Haritaashcha -- mashnute* (Ch. I. 9 / 5)	Caput medusae in portal hypertension due to cirrhosis of liver;
शरीरान्ताश्च शोभन्ते ---- राजयक्ष्मा हिनस्ति तम् *Shariranta -- hinasti tam* (Ch. I. 9 / 6)	Secondary palmar hyperhidrosis in tuberculosis (TB); Peripheral artery disease (PAD) in TB; Terminal cachexia;
अंसाभितापो हिक्का ----- भवत्यन्ताय शोषिणः *Amsaabhitapo -- soshina* (Ch. I. 9 / 7)	Cavitating pulmonary TB; Subphrenic abscess; Opportunistic infections in immunocompromised patients; Perforation of peptic ulcer; Carcinoma of chest;
वातव्याधिरपस्मारी ----- परिवर्जयतेत *Vata vyadhi -- parivarjayet* (Ch. I. 9 / 8 & 9)	Cachexia and sarcopenia in chronic debilitating conditions like CHF (congestive heart failure), COPD (chronic obstructive pulmonary disease), CKD (chronic kidney disease) and AIDS (acquired immunodeficiency syndrome)
विरेचनहुतानाहा ----- यथा प्रेतस्तथैव सः *Virechana -- pretastathaiva sa* (Ch. I. 9 / 10)	MBO (malignant bowel obstruction); Functional abdominal bloating and distension (FABD); Irritable bowel syndrome (IBS);
पेयं पातुं न शक्नोति ----- नरो न स जीवति *Peyam paatum -- na sa jeevati* (Ch. I. 9 / 11)	Liquid dysphagia or Orophrayngeal dysphagia in various neuromuscular or neurodegenerative or neuroinflammatory or infectious conditions; Lower motor neuron syndromes (LMNs); Amyotrophic lateral sclerosis (ALS); Motor neuron disease (MND); Progressive bulbar palsy (PBP);

स्वरस्य दुर्बलीभावं ----- दृष्ट्वा मरणमादिशेत् *Swarasya -- marana maadishet* (Ch. I. 9 / 12)	Advanced stages of dementia; Delirium; Lower motor neuron syndromes (LMNs); Amyotrophic lateral sclerosis (ALS); Motor neuron disease (MND); Progressive bulbar palsy (PBP);
ऊर्ध्वश्वासं गातेष्माणां ----- बुध्दिमान् परिवर्जयेत् *Urdhwa shwasam -- parivarjayet* (Ch. I. 9 / 13)	Acute abdomen; Intra-abdominal or intra pelvic hemorrhage; DIC (disseminated intravascular coagulation) in sepsis or septic shock;
अपस्वरं भाषमाणं ---- दूरतः परिवर्जयेत् *Apaswaram -- parivarjayet* (Ch. I. 9 / 14)	Auditory hallucination in Alzheirmer's dementia or other types of dementia; Delirium; Organic psychosis etc.

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number;

Table 2: Various *Arishta lakshanas* (Part-2)

Arishta lakshana	Relevant disease or pathology
यं नरं ----- तस्य मन्यते *Yam naram -- tasya manyate* (Ch. I. 9 / 15)	Various demyelinating diseases like 'Multiple sclerosis' (MS); Various autoimmune diseases like 'Relapsing polychondritis' (RP); Opportunistic infections in immunocompromised individuals; Relapsing fevers; Malaria; Leishmaniasis; Viral infections of CNS (central nervous system); Tuberculosis (TB) etc;
अथ ---- तस्य जीवितम् *Atha -- tasya jeevitam* (Ch. I. 9 / 16 & 17)	Cancer induced cachexia (CIC);
निष्ठ्यूतं अम्भसि मज्जति *Nishtyutam ambhasi majjati* पुरीषं अम्भसि मज्जति *Purisham ambhasi majjati* रेतसः अम्भसि मज्जति *Retasa ambhasi majjati* (Ch. I. 9 / 18)	Chronic airway diseases like chronic bronchitis, cystic fibrosis, Asthma, Bronchiectasis and diffuse panbronchiolitis; Cavitary pulmonary diseases, lung abscesses, TB, and lungs or bronchial carcinomas etc. Chronic constipation; Partial intestinal obstruction; Megacolon; Ulcerative colitis; Carcinoma's of gastrointestinal tract etc. Hematospermia; Pyospermia; Prostatitis; Carcinomas; Hemangiomas; varices; Epididymo-orchitis; Lymphoma; Testicular tumours; Condyloma; Leukemia; Sarcoma etc.
निष्ठ्यूते यस्य दृश्यन्ते ----- स जीवितुमर्हति *Nishtyute-- jeevitumarhati* (Ch. I. 9 / 19)	Bacterial infections; COPD (chronic obstructive pulmonary disease); Tuberculosis (TB); Melanoptysis; Carcinoma of lungs or bronchi; Bronchiectasis; Pulmonary oedema; Pneumonia; Opportunistic lung infections in immunocompromised individuals such as patients suffering with AIDS (acquired immunodeficiency syndrome) etc.
पित्तमूष्मानुगं ----- जीवितम् *Pittam -- jeevitam* (Ch. I. 9 / 20)	Inflammatory pseudo tumour of the temporal bone; Giant cell arteritis (GCA); Cavernous hemangiomas; Cavernous sinus thrombosis; Arterio-venous malformations (AVMs); Malignant lesions like angiosarcoma or liposarcoma;
सफेनम् ----- स्तथाविधः *Saphenam -- stathaa vidha* (Ch. I. 9 / 21)	Hemoptysis seen in lungs or bronchial carcinoma's, bronchitis, pneumonia, tuberculosis, congestive heart failure and lung abscesses etc. Pseudo hemoptysis (bleeding originating from upper gastrointestinal tract or upper respiratory tract pathologies);
बलमांसक्षय ----- जीवति *Bala maamsa -- jeevati* (Ch. I. 9 / 22)	Anorexia-Cachexia in lung cancers or AIDS or in chronic debilitating conditions; CIC etc.
विज्ञानानि ----- सर्वतः *Vignaanaani -- sarvata* (Ch. I. 9 / 23-24)	Aristhta lakshana's are infinite; variable (qualitatively and quantitatively); and personalized or individualized;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

REFERENCES:

1. Dadu V. Charaka - The Ayurveda encyclopedia. Eur J Pharm Med Res. 2016; 3 (7): 175-178. Available from: https://www.ejpmr.com/admin/assets/downloads/1467275632.pdf
2. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 9th chapter: Yasya shyava nimitteeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 367-369.
3. Kumar A, Karthikeyan K, Vyas MT. Osler's sign revisited. Indian Dermatol Online J. 2015; 6 (4): 308-309. doi: 10.4103/2229-5178.160302. PMID: 26225350; PMCID: PMC4513425.
4. Solanki J, Gupta S, Sharma N, Singh M, Bhateja S. Nevus of ota"- a rare pigmentation disorder with intraoral findings. J Clin Diagn Res. 2014; 8 (8): 49-50. doi: 10.7860/JCDR/2014/9978.4772. PMID: 25302286; PMCID: PMC4190813.
5. Joseph A, Samant H. Jaundice. [Updated 2019 Jul 7]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK544252/
6. Han JH, Wilber ST. Altered mental status in older patients in the emergency department. Clin Geriatr Med. 2013; 29 (1): 101-136. doi: 10.1016/j.cger.2012.09.005. PMID: 23177603; PMCID: PMC3614410.
7. Friedman LS. Liver, biliary tract and pancreatic disorders. In: Papadakis MA, McPhee SJ, Rabow MW, editors. 2015 Current Medical Diagnosis and Treatment. 54 th ed. New York, United States: McGraw Hill Education; 2015. p. 661-663.
8. Pedersen JS, Bendtsen F, Møller S. Management of cirrhotic ascites. Ther Adv Chronic Dis. 2015; 6 (3): 124-137. doi: 10.1177/2040622315580069. PMID: 25954497; PMCID: PMC4416972.

9. Dubey N, Pandey R, Kar AC. Differential diagnosis in Yakrit vikara (Liver diseases) described in Ayurveda. International Ayurvedic Medical Journal. 2015; 3 (7): 2110-2114. Available from: file:///C:/Users/prasad%20mamidi.prasadmamidi-PC/Downloads/IAMJarticle2015.pdf
10. Deka D. Cirrhosis of liver: Review from Ayurvedic literature. J Ayu Herb Med. 2017; 3 (2): 98-101. Available from: http://www.ayurvedjournal.com/JAHM_201732_10.pdf
11. Romero FR, Haddad GR, Miot HA, Cataneo DC. Palmar hyperhidrosis: clinical, pathophysiological, diagnostic and therapeutic aspects. An Bras Dermatol. 2016; 91 (6): 716-725. doi: 10.1590/abd1806-4841.20165358. PMID: 28099590; PMCID: PMC5193180.
12. Gardner AW, Afaq A. Management of lower extremity peripheral arterial disease. J Cardiopulm Rehabil Prev. 2008; 28 (6): 349-357. doi: 10.1097/HCR.0b013e31818c3b96. PMID: 19008688; PMCID: PMC2743684.
13. Wang SH, Chien WC, Chung CH, Lin FH, Peng CK, Chian CF, Shen CH. Tuberculosis increases the risk of peripheral arterial disease: A nationwide population-based study. Respirology. 2017; 22 (8): 1670-1676. doi: 10.1111/resp.13117.
14. Campbell IA, Bah-Sow O. Pulmonary tuberculosis: diagnosis and treatment. BMJ. 2006; 332 (7551): 1194-1197. doi: 10.1136/bmj.332.7551.1194. PMID: 16709993; PMCID: PMC1463969.
15. Perry S, Stevenson J. An unusual cause of hiccups. J Accid Emerg Med. 1996; 13 (5): 361-362. doi: 10.1136/emj.13.5.361. PMID: 8894871; PMCID: PMC1342780.
16. Naraqi S, Voibun M. Tuberculosis of the lower lung fields. AusI NZ J Med 1980; 10: 401-404. doi: 10.1111/j.1445-5994.1980.tb04089.x
17. Pottenger FM. Chest and Shoulder Pains in Pulmonary Tuberculosis. Trans Am Climatol Assoc. 1912; 28: 159-167. PMID: 21408565; PMCID: PMC2307349.
18. Yoshida T, Delafontaine P. Mechanisms of Cachexia in Chronic Disease States. Am J Med Sci. 2015; 350 (4): 250-256. doi: 10.1097/MAJ.0000000000000511. PMID: 26083652; PMCID: PMC4587350.
19. Baker Rogers J, Minteer JF. Cachexia. [Updated 2019 Nov 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470208/
20. Scherbakov N, Doehner W. Cachexia as a common characteristic in multiple chronic disease. J Cachexia Sarcopenia Muscle. 2018; 9 (7): 1189-1191. doi: 10.1002/jcsm.12388. PMID: 30637985; PMCID: PMC6351667.
21. von Haehling S, Anker SD. Cachexia as a major underestimated and unmet medical need: facts and numbers. J Cachexia Sarcopenia Muscle. 2010; 1 (1): 1-5. doi: 10.1007/s13539-010-0002-6. Epub 2010 Oct 26. PMID: 21475699; PMCID: PMC3060651.
22. Tradounsky G. Palliation of gastrointestinal obstruction. Can Fam Physician. 2012; 58 (6): 648-652. PMID: 22859627; PMCID: PMC3374686.
23. Tuca A, Guell E, Martinez-Losada E, Codorniu N. Malignant bowel obstruction in advanced cancer patients: epidemiology, management, and factors influencing spontaneous resolution. Cancer management and research. 2012; 4:159-169. doi: 10.2147/CMAR.S29297
24. Karkos PD, Papouliakos S, Karkos CD, Theochari EG. Current evaluation of the dysphagic patient. Hippokratia. 2009; 13 (3): 141-146. PMID: 19918301; PMCID: PMC2765291.
25. Karagiannis MJ, Chivers L, Karagiannis TC. Effects of oral intake of water in patients with oropharyngeal dysphagia. BMC Geriatr. 2011; 11: 9. doi: 10.1186/1471-2318-11-9. PMID: 21356121; PMCID: PMC3053239.
26. Crow FM. Final days at home. Can Fam Physician. 2014; 60 (6): 543-545. PMID: 24925945; PMCID: PMC4055321.
27. Mitchell SL. Advanced Dementia. N Engl J Med. 2015; 373 (13): 1276-1277. doi: 10.1056/NEJMc1509349. PMID: 26398084; PMCID: PMC4685690.
28. Harris D. Delirium in advanced disease. Postgrad Med J. 2007; 83 (982): 525-528. doi: 10.1136/pgmj.2006.052431. PMID: 17675545; PMCID: PMC2600115.
29. Hui D, Dev R, Bruera E. The last days of life: symptom burden and impact on nutrition and hydration in cancer patients. Curr Opin Support Palliat Care. 2015; 9 (4): 346-354. doi: 10.1097/SPC.0000000000000171. PMID: 26509860; PMCID: PMC4792116.
30. Gauer R. Early recognition and management of sepsis in adults: the first six hours. American family physician. 2013; 88 (1): 44-53. Available from: https://www.aafp.org/afp/2013/0701/p44.html
31. Papageorgiou C, Jourdi G, Adjambri E, Walborn A, Patel P, Fareed J, Elalamy I, Hoppensteadt D, Gerotziafas GT. Disseminated Intravascular Coagulation: An Update on Pathogenesis, Diagnosis, and Therapeutic Strategies. Clin Appl Thromb Hemost. 2018; 24 (9 Suppl): 1076029618806424. doi: 10.1177/1076029618806424. Epub ahead of print. PMID: 30296833; PMCID: PMC6710154.
32. Baglin T. Disseminated intravascular coagulation: diagnosis and treatment. BMJ. 1996; 312 (7032): 683-687. doi: 10.1136/bmj.312.7032.683. PMID: 8597738; PMCID: PMC2350519.
33. Martins S, Fernandes L. Delirium in elderly people: a review. Front Neurol. 2012; 3: 101. doi: 10.3389/fneur.2012.00101. PMID: 22723791; PMCID: PMC3377955.
34. Han JH, Wilber ST. Altered mental status in older patients in the emergency department. Clin Geriatr Med. 2013; 29 (1): 101-136. doi: 10.1016/j.cger.2012.09.005. PMID: 23177603; PMCID: PMC3614410.
35. Linszen MMJ, Lemstra AW, Dauwan M, Brouwer RM, Scheltens P, Sommer IEC. Understanding hallucinations in probable Alzheimer's disease: Very low prevalence rates in a tertiary memory clinic. Alzheimers Dement (Amst). 2018; 10: 358-362. doi: 10.1016/j.dadm.2018.03.005. PMID: 30014034; PMCID: PMC6019263.
36. Banovic S, Zunic LJ, Sinanovic O. Communication Difficulties as a Result of Dementia. Mater Sociomed. 2018; 30 (3): 221-224. doi: 10.5455/msm.2018.30.221-224. PMID: 30515063; PMCID: PMC6195406.
37. Love S. Demyelinating diseases. J Clin Pathol. 2006; 59 (11): 1151-1159. doi: 10.1136/jcp.2005.031195. PMID: 17071802; PMCID: PMC1860500.
38. Borgia F, Giuffrida R, Guarneri F, Cannavò SP. Relapsing Polychondritis: An Updated Review. Biomedicines. 2018; 6 (3): 84. doi: 10.3390/biomedicines6030084. PMID: 30072598; PMCID: PMC6164217.
39. Banchereau R, Cepika AM, Pascual V. Systems approaches to human autoimmune diseases. Curr Opin Immunol. 2013; 25 (5): 598-605. doi: 10.1016/j.coi.2013.08.005. PMID: 24055331; PMCID: PMC3924714.
40. Thomas SL, Griffiths C, Smeeth L, Rooney C, Hall AJ. Burden of mortality associated with autoimmune diseases among females in the United Kingdom. Am J Public Health. 2010; 100 (11): 2279-2287. doi: 10.2105/AJPH.2009.180273. PMID: 20864721; PMCID: PMC2951969.
41. Pandit L. Differential diagnosis of white matter diseases in the tropics: An overview. Ann Indian Acad Neurol. 2009; 12 (1): 12-21. doi: 10.4103/0972-2327.48846. PMID: 20151003; PMCID: PMC2811971.
42. Munjal S, Ferrando SJ, Freyberg Z. Neuropsychiatric Aspects of Infectious Diseases: An Update. Crit Care Clin. 2017; 33 (3): 681-712. doi: 10.1016/j.ccc.2017.03.007. PMID: 28601141; PMCID: PMC5771230.
43. Kong YC, Wei WZ, Tomer Y. Opportunistic autoimmune disorders: from immunotherapy to immune dysregulation. Ann N Y Acad Sci. 2010; 1183: 222-236. doi: 10.1111/j.1749-6632.2009.05138.x. PMID: 20146718; PMCID: PMC3815555.
44. Gullett NP, Mazurak VC, Hebbar G, Ziegler TR. Nutritional interventions for cancer-induced cachexia. Curr Probl Cancer. 2011; 35 (2): 58-90. doi: 10.1016/j.currproblcancer.2011.01.001. PMID: 21420558; PMCID: PMC3106221.

45. Rubin BK. Secretion properties, clearance, and therapy in airway disease. Transl Respir Med. 2014; 2: 6. doi: 10.1186/2213-0802-2-6. PMID: 25505698; PMCID: PMC4215824.
46. Rose C, Parker A, Jefferson B, Cartmell E. The Characterization of Feces and Urine: A Review of the Literature to Inform Advanced Treatment Technology. Crit Rev Environ Sci Technol. 2015; 45 (17): 1827-1879. doi: 10.1080/10643389.2014.1000761. PMID: 26246784; PMCID: PMC4500995.
47. Kasırga E. The importance of stool tests in diagnosis and follow-up of gastrointestinal disorders in children. Turk Pediatri Ars. 2019; 54 (3): 141-148. doi: 10.14744/TurkPediatriArs.2018.00483. PMID: 31619925; PMCID: PMC6776453.
48. Wickham RJ. Assessment of Constipation in Patients with Cancer. J Adv Pract Oncol. 2016; 7 (4): 457-462. PMID: 29226003; PMCID: PMC5679034.
49. Khan MS, Mohammad SH, Deepa F, Tahir F. Association between Pus Cells and Semen Parameters in Infertile Pakistani Males. Sultan Qaboos Univ Med J. 2012; 12 (4): 479-484. doi: 10.12816/0003174. PMID: 23275845; PMCID: PMC3523998.
50. Mathers MJ, Degener S, Sperling H, Roth S. Hematospermia-a Symptom with Many Possible Causes. Dtsch Arztebl Int. 2017; 114 (11): 186-191. doi: 10.3238/arztebl.2017.0186. PMID: 28382905; PMCID: PMC5387851.
51. Altiner A, Wilm S, Däubener W, Bormann C, Pentzek M, Abholz HH, Scherer M. Sputum colour for diagnosis of a bacterial infection in patients with acute cough. Scand J Prim Health Care. 2009; 27 (2): 70-73. doi: 10.1080/02813430902759663. PMID: 19242860; PMCID: PMC3410464.
52. Logan JI. The TG system for bedside recording of sputum colour. Ulster Med J. 2006; 75 (3): 228-229. PMID: 16967562; PMCID: PMC1891781.
53. Martínez-Girón R, Mosquera-Martínez J, Martínez-Torre S. Black-pigmented sputum. J Cytol. 2013; 30 (4): 274-275. doi: 10.4103/0970-9371.126667. PMID: 24648674; PMCID: PMC3945631.
54. Farzan S. Cough and Sputum Production. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition. Boston: Butterworths; 1990. Chapter 38. Available from: https://www.ncbi.nlm.nih.gov/books/NBK359/
55. Tian H, Liu T, Wang C, Tang L, Chen Z, Xing G. Inflammatory pseudotumor of the temporal bone: Three cases and a review of the literature. Case Red Med. 2013; 2013. Available from: https://doi.org/10.1155/2013/480476
56. Turel MK, Kiehl TR, Gentili F. Extracranial temporal cavernous hemangioma: Differential diagnosis, and a review of literature. Neurol India 2016; 64: 1347-1351. Available from: http://www.neurologyindia.com/text.asp?2016/64/6/1347/193800
57. Ness T, Bley TA, Schmidt WA, Lamprecht P. The diagnosis and treatment of giant cell arteritis. Dtsch Arztebl Int. 2013; 110 (21): 376-385; doi: 10.3238/arztebl.2013.0376. PMID: 23795218; PMCID: PMC3679627.
58. Brekke LK, Fevang BS, Diamantopoulos AP, Assmus J, Esperø E, Gjesdal CG. Survival and death cause of patients with giant cell arteritis in Western Norway 1972-2012: a retrospective cohort study. Arthritis Res Ther. 2019; 21 (1): 154. doi: 10.1186/s13075-019-1945-4. PMID: 31238961; PMCID: PMC6593490.
59. Ittrich H, Bockhorn M, Klose H, Simon M. The Diagnosis and Treatment of Hemoptysis. Dtsch Arztebl Int. 2017; 114 (21): 371-381. doi: 10.3238/arztebl.2017.0371. PMID: 28625277; PMCID: PMC5478790.
60. Corey R. Hemoptysis. In: Walker HK, Hall WD, Hurst JW, editors. Clinical Methods: The History, Physical, and Laboratory Examinations. 3rd edition. Boston: Butterworths; 1990. Chapter 39. Available from: https://www.ncbi.nlm.nih.gov/books/NBK360/
61. Del Ferraro C, Grant M, Koczywas M, Dorr-Uyemura LA. Management of Anorexia-Cachexia in Late Stage Lung Cancer Patients. J Hosp Palliat Nurs. 2012; 14 (6): doi: 10.1097/NJH.0b013e31825f3470. PMID: 24273460; PMCID: PMC3834956.

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SADYO MARANEEYAM OF *CHARAKA INDRIYA STHANA* -AN EXPLORATIVE STUDY

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REVIEW ARTICLE

SADYO MARANEEYAM OF *CHARAKA INDRIYA STHANA- AN EXPLORATIVE STUDY*

Abstract:
'Indriya sthana' (one among the eight sections of '*Charaka samhita'*, which deals with prognostic aspects) deals with the estimation of survival time frames or '*Ayu'* (life span) of the diseased person based on the '*Arishta'* (fatal signs and symptoms which denotes imminent death). '*Arishtas'* are the fatal signs of death which definitely occurs in diseased person before death. '*Indriya sthana'* is dedicated for the identification of '*Arishta lakshanas'* and estimation of prognosis. '*Indriya sthana*' consists 12 chapters and '*Sadyo maraneeyam indriyam*' is the tenth chapter of '*Charaka Indriya Sthana*'. Various '*Arishta lakshanas*', which leads to death within a short span of time are mentioned in this chapter. The word '*Sadyo'* denotes death within 3 days or 7 days. Most of the conditions explained in this chapter are 'Carcinomas', 'Vascular lesions', 'Acute abdomen' and 'Hypovolemic shock' etc emergency conditions which are having poor prognosis. Further research works are required to substantiate the clinical findings quoted in this chapter. Various pain assessment questionnaires and disease specific quality of life scales etc can be implemented or used to standardize or to assess the '*arishta lakshanas*' mentioned in this chapter. *Ayurvedic* scales or questionnaires for specific diseases should be developed for academic, clinical and research purposes. The association between *arishta lakshanas* and death due to different disease conditions as quoted in this chapter needs to be tested on various statistical parameters like sensitivity, specificity, positive and negative predictive values, false positives, and false negatives etc.

Key Words: Acute abdomen, Carcinoma, Emergency conditions, Hypovolemic shock, Pain, Quality of life

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INTRODUCTION:

'Indriya sthana' (one among the eight sections of '*Charaka samhita'*, which deals with prognostic aspects) was designed to tell the '*Ayu'* (life span) of the diseased person with the help of '*Arishta'* (fatal signs and symptoms which denotes imminent death). '*Arishtas'* are the fatal signs of death which definitely occurs in diseased person before death. Physician should be alert to identify such fatal signs. '*Arishtas'* are frequently misinterpreted due to their subtle nature or due to physician's biases. '*Indriya sthana'* is dedicated for the identification of '*Arishta lakshanas'* and estimation of prognosis. [1] '*Indriya sthana*' consists 12 chapters and '*Sadyo maraneeyam indriyam*' is the tenth chapter of '*Charaka Indriya Sthana*'. The present chapter deals with various '*Arishta lakshanas*' which leads to death within a short span. The word '*Sadyo'* denotes death within 3 days or 7 days. Most of the *arishta lakshanas* mentioned in this chapter are related to '*Vata dosha*'. Most of the conditions explained in this chapter are 'Carcinomas', 'Vascular lesions', 'Acute abdomen' and 'Hypovolemic shock' etc emergency conditions which are having poor prognosis. [2] The present work is aimed to explore the contents of the '*Sadyo maraneeyam indriyam*' chapter (Table 1 & 2) and also to analyze their prognostic significance.

MAIN CONTENTS:

वाताष्ठीला सुसंवृध्दा तिष्टन्ती दारुणा हृदि। तृष्णयाऽभिपरीतस्य सद्यो मुष्णाति जीवितम्॥

Vataashteela --- jeevitam [*Verse* 4] [2]

Various conditions like Metastatic disease, Myxoid sarcoma, Mycobacterial infections etc can cause lump like or a nodular swelling on left anterior chest wall. A patient with a lump on left anterior chest wall in the region of the 2nd and 3rd costochondral junction was diagnosed as having 'Metastatic papillary serous adenocarcinoma from ovarian primary'.[3] Diffuse nodules (सुसंवृध्दा) are more likely to be accompanied by symptoms and caused by either metastasis from extra thoracic malignancies or active infection or inflammation. [4] Neoplasms of the chest wall comprise a heterogeneous group of lesions. Thoracic malignancies can arise from any soft tissue or bony structure around the thoracic cavity (तिष्टन्ती दारुणा). Chest wall neoplasms may be either primary or metastatic. Malignant rib tumors include multiple myeloma, chondrosarcoma, osteosarcoma and Ewing's sarcoma. [5] Paraneoplastic syndromes (PNS) are commonly associated with small cell lung cancer, breast cancer, gynecologic tumours, and hematologic malignancies. Endocrinal PNS can cause electrolyte (तृष्णयाऽभिपरीतस्य?) and hormonal derangements.[6]

Patients with cardiac tumours generally have nonspecific symptoms depending on the site of the tumour and the extent of infiltration into the neighbouring tissue. Cardiac tumours (तिष्टन्ती दारुणा हृदि) include myxoma, angiosarcoma, rhabdomyosarcoma and cardiac metastases. [7] Right-sided myxomas may

present with right heart failure secondary to right ventricular outflow tract obstruction, or with syncope secondary to temporary complete obstruction of the tricuspid valve. Location of cardiac myxoma, and irregular tumour surface were independently associated with increased risk of embolic complications. Dehydration (तृष्णयाऽभिपरीतस्य) can also be seen in this condition. [8] The above verse may also denote massive aortic aneurysm, mediastinal tumours, chest metastases and chest wall tumours etc. The words like 'सुसंवृध्दा' (massive growth / hyperplasia) and 'तिष्टन्ती दारुणा' (indurated / deep seated) denote malignant lesions.

पिण्डिके शिथिलीकृत्य जिह्मीकृत्य च नासिकाम्। वायुः शरीरे विचरन् सद्यो मुष्णाति जीवितम्॥

Pindike --- jeevitam [*Verse* 5] [2]

Involvement of spinal cord vessels leads to meningomyelitis and causes muscular atrophy, spastic weakness of lower extremities (पिण्डिके शिथिलीकृत्य) in 'Neurosyphilis'. While neurosyphilis itself is a complication of syphilis, untreated neurosyphilis can result in devastating neurological sequelae, including permanent paralysis, dementia and death (सद्यो मुष्णाति जीवितम्).[9] Saddle nose (nasal cartilage destruction) (जिह्मीकृत्य च नासिकाम्) and rhinitis (snuffles) are seen in syphilis.[10] The above verse may also denote various other conditions like distal myopathies, spinal muscular atrophies, skeletal muscle atrophies, neuromuscular diseases and muscle wasting in HIV patients associated with secondary nasal infections etc.

भ्रुवौ यस्य च्युते स्थानादन्तर्दाहश्च दारुणः। तस्य हिक्काकरो रोगः सद्यो मुष्णाति जीवितम्॥

Bhruvau --- jeevitam [*Verse* 6] [2]

The majority of patients with bilateral facial palsy (भ्रुवौ यस्य च्युते) have Guillain-Barre Syndrome (GBS), multiple idiopathic cranial neuropathies, Lyme disease, sarcoidosis, meningitis (infectious or neoplastic), brain stem encephalitis, benign intracranial hypertension, leukemia, Melkersson-Rosenthal syndrome, diabetes mellitus, HIV infection, syphilis, infectious mononucleosis, Mobius Syndrome, vasculitis, bilateral neurofibromas, intrapontine and prepontine tumours, Bell's idiopathic palsy, Epstein-Barr virus (EBV) infection and Non-Hodgkin's lymphoma (NHL). [11] The most common sites of cheiro-oral syndrome (COS) occurrence is at pons, thalamus and cortex. Stroke with small infarctions or hemorrhage is the major cause of COS. Paroxysmal paresthesia (अन्तर्दाहश्च दारुणः) was predicted for cortical involvement and bilateral paresthesia (अन्तर्दाहश्च दारुणः) for pontine involvement and crossed paresthesia for medullary involvement. Deterioration (सद्यो मुष्णाति जीवितम्) occurs in those patients with large lesions of cortical infarction, medullary infarction, and bilateral subdural hemorrhage. COS involves spinothalamocortical and trigeminothalamocortical tracts between pons and sensory cortex. [12] A reflex arc involving peripheral phrenic, vagal and sympathetic pathways and central midbrain modulation is responsible for hiccup (हिक्काकरो). Any irritant in terms of physical/chemical factors, inflammation, neoplasia invading this arc leads to hiccups. The central causes of hiccup (हिक्काकरो) include stroke, space occupying lesions and injury whereas peripheral causes include lesions along the arc such as tumours, myocardial ischemia, herpes infection and GERD (gastroesophageal reflux disease). [13] The above verse indicates bilateral facial nerve palsy with paresthesia and hiccup caused by vascular brainstem lesions.

क्षीणशोणितमांसस्य वायुरूर्ध्वगतिश्चरन्। उभे मन्ये समे यस्य सद्यो मुष्णाति जीवितम्॥

Ksheena sonita --- jeevitam [*Verse* 7] [2]

The most common causes for common carotid artery occlusion (CCAO) (उभे मन्ये समे यस्य) are hypertension, ischaemic heart disease, dyslipidemia, diabetes mellitus, and smoking. Atherosclerosis is the commonest among all causes for CCAO. CCAO may be symptomatic (stroke, transient ischemic attack, dizziness, aneurysmal subarachnoid hemorrhage and deep cerebral venous thrombosis) or asymptomatic (may manifest as stroke at later stages). Takayasu's arteritis, cardioembolism (paroxysmal atrial fibrillation), postirradiation arteriopathy, cardiac embolism, dissection of the aortic arch and CCA (common carotid artery), aortic arch aneurysm, hypercoagulability, fibromuscular dysplasia, and craniocervical traumatism. [14] The above verse may also denote bilateral CCAO pathology in a patient of diabetes or carcinoma or HIV or any other chronic debilitating disease (क्षीणशोणितमांसस्य).

अन्तरेण गुदं गच्छन् नाभिं च सहसाऽनिलः। कृशस्य वंक्षणौ गृह्यन् सद्यो मुष्णाति जीवितम्॥

Antarena --- jeevitam [*Verse* 8] [2]

Hindgut structures such as the bladder, and distal two-thirds of the colon, as well as pelvic genitourinary organs usually cause pain in the suprapubic region (अन्तरेण गुदं गच्छन् नाभिं च). Pain is usually reported in the back for retroperitoneal structures such as the aorta and kidneys. Positive obturator sign (passive internal and external rotation of the hip cause pain) suggests the presence of an inflammatory process adjacent to the muscle deep in lateral walls of the pelvis. Potential diagnoses include a pelvic appendicitis (on the right only), sigmoid diverticulitis, pelvic inflammatory disease, or ectopic pregnancy. [15] Pelvic osteomyelitis, osteitis pubis, pubalgia, hip osteoarthritis, neuropathy, cancers, infections and other visceral diseases may present with groin pain (वंक्षणौ गृह्यन्). [16] Fatal Fournier's

gangrene patient may present with severe lower abdominal pain and general fatigue. [17] Various other pathological conditions like strangulated inguinal hernia (वंक्षणौ गृह्यन्), pelvic masses (benign or carcinomatous), acute abdomen (सहसा), or any other pelvic or retroperitoneal structures may present with severe groin or pelvic pain.

वितत्य पर्शुकाग्राणि गृहीत्वोरश्च मारुतः। स्तिमितस्यायताक्षस्य सद्यो मुष्णाति जीवितम्॥

Vitatya --- jeevitam [*Verse* 9] [2]

Ross syndrome is a progressive, degenerative, and autonomic nervous system disorder which comprises classical triad of Adie's tonic pupil (स्तिमितस्यायताक्षस्य), decreased or diminished tendon reflexes (स्तिमितस्य), and sweating disorders anhidrosis or hyperhidrosis (स्तिमितस्य). Chronic cough occurs as a result of efferent or afferent involvement of vagus nerve. [18] Bilateral fixed and dilated pupils (FDPs) (स्तिमितस्यायताक्षस्य) have poor prognosis (सद्यो मुष्णाति जीवितम्) and indicates an emergency situation. FDPs indicate an injury or compression of the third cranial nerve and the upper brain stem, mainly caused by an extending intracranial mass lesion or by diverse brain injury. Brain stem ischemia can cause mydriasis and brain stem symptomatology. Various underlying causes leads to FDPs are trauma, stroke, intracranial mass lesions, epidural and subdural hematomas, subarachnoid haemorrhage, rebleeding and cerebral herniation etc. [19] Hemothorax, pneumothorax (वितत्य पर्शुकाग्राणि गृहीत्वोरश्च), FDPs (स्तिमितस्यायताक्षस्य) can be seen in asphyxia due to different underlying causes. [20] The above verse denotes cardiac or respiratory conditions which cause asphyxia or apnoea.

हृदयं च गुदं चोभे गृहीत्वा मारुतो बली। दुर्बलस्य विशेषेण सद्यो मुष्णाति जीवितम्॥

Hrudayam cha --- jeevitam [*Verse* 10] [2]

Chest pain (हृदयं च गृहीत्वा) and pelvic pain (गुदं च गृहीत्वा) both can be seen in a patient of advanced lung cancer (दुर्बलस्य विशेषेण) with pelvic bone metastasis. [21] Intractable anal pain (गुदं च गृहीत्वा) in advanced stages of rectal, bladder or pelvic cancers may be associated with metastases of lungs or heart or pericardium which may cause chest pain (हृदयं च गृहीत्वा). Patients with aortic dissection and aneurysm (AD) presents with a variety of complaints and symptoms. The major complaints include severe chest and back pain (हृदयं च गुदं चोभे गृहीत्वा), which can move with the progression of AD. AD can lead to heart failure, syncope, stroke, paraplegia, anuria or sudden death (सद्यो मुष्णाति जीवितम्). [22]

वंक्षणं च गुदं चोभे गृहीत्वा मारुतो बली। श्वासंसंजनयञ्जन्तोः सद्यो मुष्णाति जीवितम्॥

Vankshanam --- jeevitam [*Verse* 11] [2]

Groin pain (वंक्षणं गृहीत्वा) can occur in various conditions like inguinal hernia (strangulated), testicular torsion, avascular necrosis of hip, osteitis pubis, osteomyelitis, septic arthritis, pelvic inflammatory conditions (prostatitis, epididymo-orchitis and herpes), endometriosis, inflammatory bowel disease, nerve entrapment syndrome, testicular carcinoma and osteoid osteoma. [23] Rectal adenocarcinoma with inguinal lymph node metastasis (ILNM), [24] colorectal cancer with secondary lung metastasis or lung cancer metastases (श्वासंसंजनयञ्जन्तोः) to the lower gastrointestinal tract (rectum) [25] and cervical cancer may present with pelvic pain (वंक्षणं च गुदं चोभे गृहीत्वा). [26] Causes for ACS (abdominal compartment syndrome) causes include trauma, haemorrhage, rupture of abdominal aortic aneurysm (AAA), intestinal obstruction, and retroperitoneal hematoma. Secondary causes include ascites, ileus, burns and intra-abdominal sepsis. Patients with ACS may present with abdominal pain (वंक्षणं च गुदं चोभे गृहीत्वा), wheezing and breathing difficulty (श्वासंसंजनयञ्जन्तोः).[27] Acute-onset pain, with severity should prompt immediate concern about a potential intra-abdominal catastrophe (सद्यो मुष्णाति जीवितम्), like a ruptured AAA, perforated viscus, mesenteric ischemia or torsion. The neural pathways give rise to predictable patterns of referred pain and radiation. The groin (वंक्षणं गृहीत्वा) was the most common site of radiation in above conditions. [28] The above verse indicates various carcinomas, pathological conditions of pelvic organs and acute abdomen etc.

नाभिं मूत्रं वस्तिशीर्षं पुरीषं चापि मारुतः। प्रच्छिन्नं जनयञ्छूलं सद्यो मुष्णाति जीवितम्॥

Naabhim --- jeevitam [*Verse* 12] [2]

Subcaecal and pelvic appendicitis is characterized by suprapubic pain (वस्तिशीर्षम्), urinary frequency, rectal or vaginal tenderness, diarrhoea (due to irritation of the rectum) (पुरीषं प्रच्छिन्न) and microscopic haematuria with leucocytes. [29] The initial presentation of nephrolithiasis is renal colic (जनयञ्छूलम्) which is characterized by severe pain (जनयञ्छूलम्) caused by stone passage. Pain starts in the flank area, and progresses downward and anteriorly into the genital region (वस्तिशीर्षम्) as the stone moves down the ureter. Hematuria is always present, but may be microscopic. Uric acid stones and ammonium acid urate stones are associated with diarrheal illness (पुरीषं प्रच्छिन्न). [30] Many genitourinary tract diseases can present with abdominal pain. Inflammatory process contiguous to the genitourinary tract (appendicitis, cholecystitis, pancreatitis, or any inflammatory process involving bowel) may result in both pyuria and dysuria (नाभिं मूत्रं वस्तिशीर्षं जनयञ्छूलम्). [16] The above verse denotes renal colic or pelvic appendicitis, urinary tract infections like pyelonephritis and cystitis, and pelvic neoplasms etc.

भिद्येते वंक्षणौ यस्य वातशूलैः समन्ततः। भिन्नं पुरीषं तृष्णा च सद्य प्राणाञ्जहति सः॥

Bhidyete --- pranajjahati sa [*Verse* 13] [2]

Nontraumatic spontaneous hemoperitoneum is catastrophic (सद्य प्राणाञ्जहति सः) and associated with severe abdominal pain (भिद्येते वंक्षणौ यस्य वातशूलैः समन्ततः) and distention, a decreased hematocrit level and hypovolemic shock (तृष्णा ?). It has various possible causes, including hemorrhage from a highly vascular neoplasm (tumour-associated hemorrhage), hemorrhage or rupture of an ovarian cyst, rupture of the gestational sac or other affected anatomic part in an ectopic pregnancy, and bleeding from a vascular lesion such as an arterial aneurysm. [31] Dehydration (तृष्णा) is a possible cause of severe abdominal pain (भिद्येते वंक्षणौ यस्य वातशूलैः समन्ततः). Dehydration related abdominal pain (DRAP) (वातशूलैः & तृष्णा) has been found in the patients of 'Acute abdomen'. [32] Abdominal pain is the most common reason for a visit to the emergency department (ED) (सद्य प्राणाञ्जहति सः). Suprapubic pain (भिद्येते वंक्षणौ यस्य वातशूलैः समन्ततः) is caused by hindgut structures such as the bladder, and distal two-thirds of the colon, as well as pelvic genitourinary organs. Back pain is caused by the retroperitoneal structures such as the aorta and kidneys. Severe pain indicates a serious underlying cause. Diarrhoea (भिन्नं पुरीषम्) is common in mesenteric ischemia and is frequently reported in conditions such as appendicitis, surgical conditions of abdomen and colonic obstruction. Diarrhoea (भिन्नं पुरीषम!) also occurs in early small bowel obstruction and in partial obstruction. The urge to defecate (भिन्नं पुरीषम्) in a patient with acute abdominal pain (वातशूलैः समन्ततः) has been described as a harbinger of serious disease (सद्य प्राणाञ्जहति सः) including a ruptured aneurysm in older patients or ruptured ectopic pregnancy in young patients. [16] The above verse indicates various conditions like acute abdomen, small bowel or colonic obstruction, hemoperitonium, mesenteric ischemia and various other inflammatory, vascular, infectious and neoplastic causes of abdomen and pelvis.

आप्लुतं मारुतेनेह शरीरं यस्य केवलम्। भिन्नं पुरीषं तृष्णा च सद्यो जह्यात् स जीवितम्॥

Aaplutam --- jeevitam [*Verse* 14] [2]

Dehydration (तृष्णा) is a loss of body fluids, which are made up of water and salts. Patients with diarrhoea (भिन्नं पुरीषम्) lose large amounts of salts and water from their bodies, and can become dehydrated very quickly which can be very dangerous (सद्यो जह्यात् स जीवितम्), especially for children. Decreased urination, lack of tears, dry skin, mouth and tongue, sunken eyes, grayish skin, sunken soft spot (fontanel) on infant's head etc (आप्लुतं मारुतेनेह शरीरं यस्य केवलम्) are the signs of dehydration associated with diarrhoea. Children with diarrhoea (भिन्नं पुरीषम्) may also complain stomach pains and cramps (आप्लुतं मारुतेनेह शरीरं यस्य केवलम्). Most commonly diarrhoea in children is caused by a virus (Rotavirus) and occasionally by bacteria (*Campylobacter*, *Salmonella*, *Shigella* and *E coli*). [33] Several different viruses including rotavirus, norovirus, adenovirus, and astroviruses account for most cases of acute viral gastroenteritis (भिन्नं पुरीषम्). Acute infectious gastroenteritis is a common illness and viral pathogens cause most of the cases. The acute diarrheal disease can have significant morbidity for young and elderly patients. Viral gastroenteritis is a known cause of nausea, vomiting, diarrhoea, anorexia, weight loss and dehydration (तृष्णा). [34] Various other conditions like IBS (irritable bowel syndrome), Crohn's disease, ulcerative colitis, microscopic colitis, celiac disease, chronic pancreatitis, malabsorption syndromes, hyperthyroidism, neuro-endocrine tumours, SIBO (small intestinal bacterial overgrowth), tropical sprue, colon cancer, lymphoma, villous adenocarcinoma, diverticulitis, chronic bacterial and protozoal infection are associated with diarrhoea (भिन्नं पुरीषम्) and electrolyte disturbances (तृष्णा).[35]

शरीरं शोफितं यस्य वाताशोफेन देहिनः। भिन्नं पुरीषं तृष्णा च सद्यो जह्यात् स जीवितम्॥

Shariram --- jeevitam [*Verse* 15] [2]

Children who were dying from "digestive system diseases" and presenting with diarrhoea (भिन्नं पुरीषम्), cough, coryza, and dyspnoea also were having symptoms of kwashiorkor during this time (pitting oedema (शरीरं शोफितं यस्य), anorexia and skin changes). Kwashiorker was concluded to be the secondary cause of death because many cases of the disease would not have developed without the precipitating stress of diarrhoea, dehydration (तृष्णा), HIV and measles. Kwashiorkor is a disease of edematous malnutrition (शरीरं शोफितं यस्य). Abnormalities of the gastrointestinal tract like atrophy of the pancreas and the mucosa of small intestine, lactase deficiency, ileus, bacterial overgrowth which can lead to bacterial septicemia and death (सद्यो जह्यात् स जीवितम्), hypovolemic shock or cardiovascular system collapse and electrolyte abnormalities (तृष्णा) are the complications of Kwashiorkor. [36] It should be kept in mind that all children with watery diarrhoea (भिन्नं पुरीषम्) or reduced urine output have some dehydration (तृष्णा). Poor circulatory volume or perfusion can co-exist with oedema (शरीरं शोफितं यस्य) in severe acute malnutrition cases. [37]

आमाशय समुत्थाना यस्य स्यात् परिकर्तिका। भिन्नं पुरीषं तृष्णा च सद्यः प्राणाञ्जहति सः॥

Aamashaya --- pranajjahati sa [*Verse* 16] [2]

Gastroenteritis caused by the viruses may be associated with severe gastroduodenal complications such as

gastroduodenal perforation or ulcer (GDPU) along with diarrhoea and dehydration. [38] Perforated peptic ulcer (PPU) is a surgical emergency and is associated with short-term mortality (सद्यः प्राणाञ्जहति सः). Patients with PPU may present with severe, sudden-onset epigastric pain (आमाशय परिकर्तिका), which can become generalised. [39] Acute diarrhoea (severe, watery diarrhea) (भिन्नं पुरीषम्) when associated with major loss of fluids may leads to circulatory collapse especially in children, people with weakened immune systems and older people. Because older people often feel less thirsty, and may not drink enough as a result, they are at greater risk of dehydration (not having enough fluids in the body) (तृष्णा). Older people may sometimes have chest pain (आमाशय परिकर्तिका) or muscle cramps too due to dehydration (तृष्णा). [40] The above verse denotes various conditions like peptic ulcer disease, perforation of peptic or duodenal ulcer, upper gastrointestinal tract bleeding, acute bacterial or viral gastroenteritis, acute pancreatitis and acute abdomen etc.

पक्वाशय समुत्थाना यस्य स्यात् परिकर्तिका। तृष्णा गुदग्रहश्चोग्रः सद्यो जह्यात् स जीवितम्॥

Pakwashaya --- jeevitam [*Verse* 17] [2]

Proctalgia fugax or functional recurrent anorectal pain is part of a spectrum of functional gastrointestinal disorders occurs as episodes of sharp fleeting pain localized to the anus or lower rectum (गुदग्रहश्चोग्रः). Although the cause of proctalgia fugax is unclear, spasm of the anal sphincter (गुदग्रहश्चोग्रः) is commonly implicated. Other causes of anorectal pain are hemorrhoids, cryptitis, ischemia, abscess, fissure, rectocele and malignant disease. [41] Ulcerative colitis (UC) and Crohn's disease (CD) both are collectively termed inflammatory bowel disease (IBD), are complex disorders reflected by wide variation in clinical practice. The cardinal symptom of UC is bloody diarrhoea, colicky abdominal pain (पक्वाशय समुत्थाना), urgency, tenesmus (परिकर्तिका) and fluid depletion (तृष्णा). UC is a severe disease that used to carry a high mortality (सद्यो जह्यात् स जीवितम्) and major morbidity. [42]

The acute complications of colon cancer include bleeding, obstruction, and perforation, which are common acute abdominal surgical conditions (सद्यो जह्यात् स जीवितम्). Thirst (तृष्णा) can be seen due to persistent bleeding in colon cancer; fluid and electrolyte loss (तृष्णा) and infection (toxaemia) is seen in obstruction caused by colon cancer. Most patients with intestinal obstruction due to colon cancer have abdominal pain (परिकर्तिका). The intestinal ischemic necrosis and intestinal strangulation can be manifested as persistent severe abdominal pain (पक्वाशय समुत्थाना). [43] Toxic megacolon is a life-threatening disease (सद्यो जह्यात् स जीवितम्) and is one of the most serious complications of *Clostridium difficile* infection (CDI). The absence of diarrhoea due to ileus, rapid abdominal distension, abdominal pain and tenderness (पक्वाशय समुत्थाना), tachycardia and hypotension in patients diagnosed with CDI are important signs of a progression to toxic megacolon. Dehydration (तृष्णा) and abdominal cramps (परिकर्तिका) are also seen in CDI. Early diagnosis and treatment are crucial due to the increased mortality (सद्यो जह्यात् स जीवितम्) (colonic perforation, peritonitis, septic shock and multiple organ dysfunction). [44]

पक्वाशयमधिष्ठाय हत्वा संज्ञां च मारुतः। कण्ठे घुर्घरकं कृत्वा सद्यो हरति जीवितम्॥

Pakwashaya --- jeevitam [*Verse* 18] [2]

घुर्घरकमित्याकारं शब्दं स कफावरुध्देन श्वासेन भवति।

Ghurgarakam --- bhavati [*Chakrapani*, *Verse* 18] [2]

Colon or colorectal cancer (पक्वाशयमधिष्ठाय) may leads to metastatic pulmonary lymphangitic carcinomatosis (characterized by diffuse spread of the tumour to the pulmonary lymphatic system). Rhonchi (lung sounds that occur when the air passes through bronchial tubes filled with fluid or mucus) (कण्ठे घुर्घरकं कृत्वा) and crackles can be heard at the base of both lungs. A radiograph of her chest shows diffuse interstitial and septal thickening in both lungs. This condition is having extremely poor prognosis (सद्यो हरति जीवितम्) in most cases. [45] Lung cancer is the most common cause of cancer-related mortality (सद्यो हरति जीवितम्) worldwide. Patients with lung cancer with secondary metastasis to colon (पक्वाशयमधिष्ठाय) may present with dyspnoea (कण्ठे घुर्घरकं कृत्वा) and hyponatremia. Secondary metastatic colonic lesions may cause intestinal obstruction and perforation which further may leads to severe lung failure, dehydration and metabolic disorder. [46] Cardiovascular manifestations have been reported in IBD (inflammatory bowel disease) (पक्वाशयमधिष्ठाय) patients include pericarditis, myocarditis, venous and arterial thromboembolism (कण्ठे घुर्घरकं कृत्वा), arrhythmias, atrioventricular block, heart failure (सद्यो हरति जीवितम्), endocarditis, valvulopathies, and Takayasu arteritis. Patients with IBD have a higher risk for developing myopericarditis than the general population. The clinical picture for myopericarditis may present with symptoms similar to those of the acute coronary syndrome, heart failure (new onset or decompensated heart failure), arrhythmias, cardiogenic shock, or sudden death (हत्वा संज्ञां च मारुतः). [47]

दन्ताः कर्दमदिग्धाभा मुखं चूर्णकसन्निभम्। सिप्रायन्ते च गात्राणि लिङ्गं सद्यो मरिष्यतः॥

Dantaa --- marishyata [*Verse* 19] [2]

मुखं चूर्णकसन्निभं श्वैत्यात्। सिप्रायन्ते इति सिप्रा नदी तद्वत् स्वेदातिप्रादुभ र्वादाचरन्तीति सिप्रायन्ते। किंवा सिप्रायन्त इति शिथिलीभवन्ति अनेकार्थत्वाद्धातूनाम्॥

Mukham --- dhatunaam [*Chakrapani*, *Verse* 19] [2]

Uremic frost (whitish powdery frost, which was present all over the body, especially over the face and limbs) (मुखं चूर्णकसन्निभम्) is a manifestation of advanced CKD. Evaporation of sweat with high urea concentration causes urea to crystallize and deposit on the skin. The frost consists of a white or yellowish coating of urea crystals on the beard area and other parts of the face (मुखं चूर्णकसन्निभम्), neck and on the trunk. It is due to eccrine deposition of urea crystals on the skin surface of patients with severe uremia. [48] Severe periodontal diseases were more prevalent in patients with more severe CKD (chronic kidney disease) than in those with less severe CKD. Oral manifestations of chronic renal disease are common during the progression of uraemia. Xerostomia, uraemic stomatitis, periodontal disease (दन्ताः कर्दमदिग्धाभा) and maxillary & mandibular radiographic alterations can be observed in patients with CRF (chronic renal failure). Periodontal diseases are highly prevalent among patients with CRF, specifically gingivitis, excessive plaque formation and poor oral hygiene (दन्ताः कर्दमदिग्धाभा) in uraemic patients. [49]

Regarding sweating in the patients of ESRD (end stage renal disease) or CRF or CKD there are contradictory evidences like some studies have found decreased sweating (uremic xerosis) and some studies have mentioned excessive perspiration (due to rhabdomyolysis). The dry skin of uremic xerosis is often associated with atrophy of sebaceous and sudoriferous glands with decreased sweating. A decrease in the number of sudoriferous glands can also be noticed. Xerotic skin and premature ageing of the skin can be seen in chronic renal failure patients. [50] It has been well established phenomenon that, the elimination of blood urea occurs through excessive perspiration (सिप्रायन्ते च गात्राणि) in chronic renal failure patients. Through the mechanism of perspiration, the skin can take over the functions of eliminating body toxins like urea etc in chronic renal failure patients. [51] Sweating is a physical finding which can be identified easily by a physician without any clinical instruments or laboratory tests and it is extremely valuable in the daily clinical setting. Rhabdomyolysis is a serious syndrome which may lead to acute kidney injury and even death. The presence of excessive sweating (सिप्रायन्ते च गात्राणि) is a useful factor to predict the serious prognosis of death (लिङ्गं सद्यो मरिष्यतः) or acute kidney injury in the patients of rhabdomyolysis. [52] The above verse denotes ESRD, CRF, CKD, acute kidney injury, uremic frost, rhabdomyolysis and carcinomatous conditions.

तष्णाश्वासशिरोरोगमोहदौर्बल्यकूजनैः। स्पृष्टः प्राणाञ्जहत्याशु शकृद्भेदेन चातुरः॥
Trishna --- chaatura [*Verse* 20] [2]

Patients with hypovolemic shock have severe hypovolemia with decreased peripheral perfusion. Hypovolemia can lead to ischemic injury of vital organs and multi-system organ failure (प्राणाञ्जहत्याशु). Hypovolemic shock is the most common type of shock in children, most commonly due to diarrheal illness (शकृद्भेदेन). Patients with volume depletion may complain of thirst (तृष्णा), muscle cramps, and/or orthostatic hypotension (शिरोरोग). Severe hypovolemic shock can result in mesenteric and coronary ischemia that can cause abdominal or chest pain. Agitation, lethargy (दौर्बल्य), or confusion (मोह) may result from brain malperfusion (शिरोरोग). [53] Apnea periods (prolonged pauses between each breath), Cheyne-Stokes breathing (alternative apnea and hyperapnia with a crescendo-decrescendo pattern) (श्वास), death rattle (gurgling sound produced during inspiration and/or expiration due to airway secretions) (कूजनम्), decreased level of consciousness (मोह), decreased performance (दौर्बल्य) and dysphagia of liquids (which leads to तृष्णा) etc are the highly specific physical signs associated with death (स्पृष्टः प्राणाञ्जहत्याशु) within 3 days among cancer patients. [54] The above verse indicates either hypovolemic shock or delirium or advanced stages of carcinoma. The '*Arishta lakshanas*' explained in this chapter may assist the clinicians in formulating the diagnosis of impending death, help patients and families in preparing ahead, and support researchers in further investigating the process of dying.

CONCLUSION:

Most of the conditions explained in this chapter are carcinomas, vascular lesions, acute abdomen and hypovolemic shock etc emergency conditions which are having poor prognosis. Visual analogue scale for pain, Pain in advanced dementia (PAINAID), Cancer Total Quality Pain Management patient assessment tool (TQPM), Family pain questionnaire, Patient pain interview, the breakthrough pain questionnaire, and Abdominal pain index etc scales and questionnaire are available to assess pain. Quality of Life (QoL) in cancer, The assessment of quality of life at the end of life (AQEL) questionnaire, The Quality of Dying and Death questionnaire (QODD), Functional Living Cancer questionnaire (FLIC), Karnofsky performance status and Palliative care Quality of Life Instrument (PQLI) etc questionnaires and scales (which are useful to assess pain, end of life in cancer patients) can be implemented or used to standardize or to assess the '*arishta lakshanas*' mentioned in this chapter. Such type of *Ayurvedic* scales or questionnaires should be developed for academic, clinical and research usage purposes.

Table 1: Various *Arishta lakshanas* (Part-1)

Arishta lakshana	Relevant disease or pathology
वाताष्ठीला ---- जीवितम् *Vataashtila --- jeevitam* (Ch. I. 10 / 4)	Metastatic papillary serous adenocarcinoma from ovarian primary; Thoracic malignancies; PNS (paraneoplastic syndrome); Massive aortic aneurysm; Chest metastases; Mediastinal tumours;
पिण्डिके ---- जीवितम् *Pindike --- jeevitam* (Ch. I. 10 / 5)	Neuro syphilis with saddle nose; Distal myopathies; Neuromuscular conditions; Neurodegenerative and demyelinating conditions; Muscle wasting in HIV patients;
भ्रुवौ ---- जीवितम् *Bhruvau --- jeevitam* (Ch. I. 10 / 6)	Bilateral facial palsy; GBS (Guillain-Barre syndrome); Cheiro-oral syndrome (COS); Vascular brain stem lesions;
क्षीण ---- जीवितम् *Ksheena --- jeevitam* (Ch. I. 10 / 7)	CCAO (common carotid artery occlusion) due to various underlying conditions);
अन्तरेण ---- जीवितम् *Antarena --- jeevitam* (Ch. I. 10 / 8)	Pelvic appendicitis; Strangulated inguinal hernia; Fatal Fournier's gangrene; Pelvic carcinomas; Acute abdomen; Pelvic osteomyelitis; Osteitis pubis;
वितत्य ---- जीवितम् *Vitatya--- jeevitam* (Ch. I. 10 / 9)	Ross syndrome; FDPs (fixed bilateral dilated pupils) due to various underlying conditions; Hemothorax; Pneumothorax; Brain stem lesions;
हृदयं ---- जीवितम् *Hrudayam --- jeevitam* (Ch. I. 10 / 10)	Advanced lung cancer with pelvic bone metastasis; Aortic dissection and aneurysm;
वंक्षणम् ---- जीवितम् *Vankshanam --- jeevitam* (Ch. I. 10 / 11)	Strangulated inguinal hernia; Testicular torsion; Pelvic inflammatory or infectious or neoplastic conditions; Rectal adenocarcinoma with inguinal lymph node metastasis (ILNM); ACS (abdominal compartment syndrome); Acute abdomen; Ruptured AAA (abdominal aortic aneurysm);
नाभिं ---- जीवितम् *Naabhim --- jeevitam* (Ch. I. 10 / 12)	Renal colic; Ureteric colic; Pelvic appendicitis; Pyelonephritis; Cystitis; UTI (urinary tract infections); Carcinomas;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

Table 2: Various *Arishta lakshanas* (Part-2)

Arishta lakshana	Relevant disease or pathology
भिद्येते ---- प्राणाञ्जहति सः *Bidhyete --- pranajjahati sa* (Ch. I. 10 / 13)	Hemoperitoneum causing hypovolemic shock; Ruptured aortic aneurysm; Acute abdomen; DRAP (dehydration related abdominal pain); Mesenteric ischemia; Colonic obstruction; Highly vascular neoplasms;
आप्लुतं ---- जीवितम् *Aaplutam --- jeevitam* (Ch. I. 10 / 14)	Acute infectious (bacterial or viral) gastro enteritis; IBS (irritable bowel syndrome); IBD (inflammatory bowel disease); SIBO (small intestinal bacterial overgrowth);
शरीरं ---- जीवितम *Shariram --- jeevitam* (Ch. I. 10 / 15)	Kwashiorkor with diarrhoea;
आमाशय ---- प्राणाञ्जहति सः *Aamashaya --- pranajjahati sa* (Ch. I. 10 / 16)	GDPU (gastroduodenal perforation or ulcer); PPU (perforated peptic ulcer); Acute abdomen; Acute pancreatitis;
पक्वाशय ---- जीवितम् *Pakvashaya --- jeevitam* (Ch. I. 10 / 17)	Proctalgia fugax; IBD; Ulcerative colitis; Crohn's disease; Toxic megacolong; Colorectal carcinoma; Colonic perforation; Peritonitis; Septic shock;
पक्वाशयमधिष्ठाय ---- जीवितम् *Pakvashaya --- jeevitam* (Ch. I. 10 / 18)	Metastatic pulmonary lymphangitic carcinomatosis with primary colorectal cancer; Lung cancer with secondary metastasis to colon; Myopericarditis of IBD;
दन्ताः ---- लिङ्गं सद्यो मरिष्यतः *Dantaa --- marishyata* (Ch. I. 10 / 19)	Uremic frost; Uremic stomatitis or periodontitis; ESRD (end stage renal disease); CRF (chronic renal failure); CKD (chronic kidney disease); Rhabdomyolysis in acute kidney injury; Carcinomas;
तृष्णा ---- चातुरः *Trushnaa --- chaatura* (Ch. I. 10 / 20)	Hypovolemic shock; Delirium; Advanced stages of carcinoma;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

REFERENCES:

1. Mayur NS, Bharat C, Namrata C, Bhushan M. Relevance of indriyasthan in the prognosis of diseases: A review. Int. J. Res. Ayurveda Pharm. 2018; 9 (1): 9-12. http://dx.doi.org/10.7897/2277-4343.0913
2. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 10th chapter: Sadyo maraneeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 369.
3. Chatha DS, Rybak LD, Wittig JC, Desai P. Chest wall mass in a 50-year-old woman. Clin Orthop Relat Res. 2010; 468 (5): 1462-1466. doi: 10.1007/s11999-009-1113-2. PMID: 19806412; PMCID: PMC2853672.
4. Gould MK, Donington J, Lynch WR, Mazzone PJ, Midthun DE, Naidich DP, Wiener RS. Evaluation of individuals with pulmonary nodules: when is it lung cancer? Diagnosis and management of lung cancer, 3rd ed: American College of Chest Physicians evidence-based clinical practice guidelines. Chest. 2013; 143 (5 Suppl): e93S-e120S. doi: 10.1378/chest.12-2351. PMID: 23649456; PMCID: PMC3749714.
5. Lin GQ, Li YQ, Huang LJ, Luo FY, Jiang HH, Luo WJ. Chest wall tumors: Diagnosis, treatment and reconstruction. Exp Ther Med. 2015; 9 (5): 1807-1812. doi: 10.3892/etm.2015.2353. PMID: 26136897; PMCID: PMC4471685.
6. Pelosof LC, Gerber DE. Paraneoplastic syndromes: an approach to diagnosis and treatment. Mayo Clin Proc. 2010; 85(9):838-54. doi: 10.4065/mcp.2010.0099. Erratum in: Mayo Clin Proc. 2011; 86 (4): 364. Dosage error in article text. PMID: 20810794; PMCID: PMC2931619.
7. Hoffmeier A, Sindermann JR, Scheld HH, Martens S. Cardiac tumors--diagnosis and surgical treatment. Dtsch Arztebl Int. 2014; 111 (12): 205-211. doi: 10.3238/arztebl.2014.0205. PMID: 24717305; PMCID: PMC3983698.
8. Babs Animashaun I, Akinseye OA, Akinseye LI, Akinboboye OO. Right Atrial Myxoma and Syncope. Am J Case Rep. 2015; 16: 645-647. doi: 10.12659/AJCR.894513. PMID: 26390076; PMCID: PMC4582919.
9. Ha T, Tadi P, Dubensky L. Neurosyphilis. [Updated 2020 Feb 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK540979/
10. Tudor ME, Al Aboud AM, Gossman WG. Syphilis. [Updated 2019 Oct 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK534780/
11. Pothiawala S, Lateef F. Bilateral facial nerve palsy: a diagnostic dilemma. Case Rep Emerg Med. 2012; 2012: 458371. doi: 10.1155/2012/458371. PMID: 23326715; PMCID: PMC3542940.
12. Chen WH. Cheiro-oral syndrome: a clinical analysis and review of literature. Yonsei Med J. 2009; 50 (6): 777-783. doi: 10.3349/ymj.2009.50.6.777. PMID: 20046417; PMCID: PMC2796403.
13. Chang FY, Lu CL. Hiccup: mystery, nature and treatment. J Neurogastroenterol Motil. 2012; 18 (2): 123-130. doi: 10.5056/jnm.2012.18.2.123. PMID: 22523721; PMCID: PMC3325297.
14. Jadhav AP, Ducruet AF, Jankowitz BT, Jovin TG. Management of Bilateral Carotid Occlusive Disease. Interv Neurol. 2016; 4 (3-4): 96-103. doi: 10.1159/000442530. PMID: 27051405; PMCID: PMC4817383.
15. Bajkó Z, Bălaşa R, Moţăţăianu A, Maier S, Chebuţ OC, Szatmári S. Common carotid artery occlusion: a case series. ISRN Neurol. 2013; 2013: 198595. doi: 10.1155/2013/198595. PMID: 24167740; PMCID: PMC3791643.
16. Macaluso CR, McNamara RM. Evaluation and management of acute abdominal pain in the emergency department. Int J Gen Med. 2012; 5: 789-797. doi: 10.2147/IJGM.S25936. PMID: 23055768; PMCID: PMC3468117.
17. Hawkins AP, Sum JC, Kirages D, Sigman E, Sahai-Srivastava S. Pelvic osteomyelitis presenting as groin and medial thigh pain: a resident's case problem. J Orthop Sports Phys Ther. 2015; 45 (4): 306-315. Available from: https://www.jospt.org/doi/10.2519/jospt.2015.5546
18. Takano, N., Yatabe, M.S., Yatabe, J. et al. Fatal Fournier's gangrene caused by Clostridium ramosum in a patient with central diabetes insipidus and insulin-dependent diabetes mellitus: a case report. BMC Infect Dis 2018; 363: 2018. https://doi.org/10.1186/s12879-018-3280-9
19. Baran A, Balbaba M, Demir CF, Ozdemir HH. A case of Ross syndrome presented with Horner and chronic cough. J Neurosci Rural Pract. 2014; 5 (4): 394-397. doi: 10.4103/0976-3147.139997. PMID: 25288844; PMCID: PMC4173239.
20. Clusmann H, Schaller C, Schramm J. Fixed and dilated pupils after trauma, stroke, and previous intracranial surgery: management and outcome. J Neurol Neurosurg Psychiatry. 2001; 71 (2): 175-181. doi: 10.1136/jnnp.71.2.175. PMID: 11459888; PMCID: PMC1737504.
21. Sedik AM, Elhoushy S. Traumatic asphyxia. A case report and literature review. Saudi Surg J 2018; 6: 63-65. Available from: http://www.saudisurgj.org/text.asp?2018/6/2/63/233495
22. Simmons CP, Macleod N, Laird BJ. Clinical management of pain in advanced lung cancer. Clin Med Insights Oncol. 2012; 6: 331-346. doi: 10.4137/CMO.S8360. PMID: 23115483; PMCID: PMC3474460.
23. Yanagawa Y, Sakamoto T. Characteristics of patients that experience cardiopulmonary arrest following aortic dissection and aneurysm. J Emerg Trauma Shock. 2013; 6 (3): 159-163. doi: 10.4103/0974-2700.115320. PMID: 23960370; PMCID: PMC3746435.
24. Bisciotti GN, Auci A, Di Marzo F, Galli R, Pulici L, Carimati G, Quaglia A, Volpi P. Groin pain syndrome: an association of different pathologies and a case presentation. Muscles Ligaments Tendons J. 2015; 5 (3): 214-222. doi: 10.11138/mltj/2015.5.3.214. PMID: 26605198; PMCID: PMC4617224.
25. Hagemans JAW, Rothbarth J, van Bogerijen GHW, van Meerten E, Nuyttens JJME, Verhoef C, Burger JWA. Treatment of Inguinal Lymph Node Metastases in Patients with Rectal Adenocarcinoma. Ann Surg Oncol. 2019; 26 (4): 1134-1141. doi: 10.1245/s10434-019-07191-4. PMID: 30725310; PMCID: PMC6399178.
26. Noergaard MM, Stamp IM, Bodtger U. Disseminated lung cancer presenting as a rectal mass. Eur Clin Respir J. 2016; 3: 31726. doi: 10.3402/ecrj.v3.31726. PMID: 27683028; PMCID: PMC5040824.
27. Das S, Jeba J, George R. Cancer and treatment related pains in patients with cervical carcinoma. Indian J Palliative Care 2005; 11 (2): 74-81. doi: 10.4103/0973-1075.19183
28. Newman RK, Dayal N, Dominique E. Abdominal Compartment Syndrome. [Updated 2019 Oct 21]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK430932/
29. Chanana L, Jegaraj MA, Kalyaniwala K, Yadav B, Abilash K. Clinical profile of non-traumatic acute abdominal pain presenting to an adult emergency department. J Family Med Prim Care. 2015; 4 (3): 422-425. doi: 10.4103/2249-4863.161344. PMID: 26288785; PMCID: PMC4535107.
30. Humes DJ, Simpson J. Acute appendicitis. BMJ. 2006; 333 (7567): 530-534. doi: 10.1136/bmj.38940.664363.AE. PMID: 16960208; PMCID: PMC1562475.
31. Worcester EM, Coe FL. Nephrolithiasis. Prim Care. 2008; 35 (2): 369-391, vii. doi: 10.1016/j.pop.2008.01.005. PMID: 18486720; PMCID: PMC2518455.
32. Lubner M, Menias C, Rucker C, Bhalla S, Peterson CM, Wang L, Gratz B. Blood in the belly: CT findings of hemoperitoneum. Radiographics. 2007; 27 (1): 109-125. Available from: https://doi.org/10.1148/rg.271065042
33. Shah SI, Aurangzeb, Khan I, Bhatti AM, Khan AA. Dehydration related abdominal pain. J Coll Physicians Surg Pak. 2004; 14 (1): 14-17. doi: 01.2004/JCPSP.1417

34. Dehydration and diarrhea. Paediatr Child Health. 2003; 8 (7): 459-468. doi: 10.1093/pch/8.7.459. PMID: 20019956; PMCID: PMC2791660.
35. Stuempfig ND, Seroy J. Viral Gastroenteritis. [Updated 2019 Jun 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK518995/
36. Descoteaux-Friday GJ, Shrimanker I. Chronic Diarrhea. [Updated 2019 Jul 5]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK544337/
37. Benjamin O, Lappin SL. Kwashiorkor. [Updated 2019 Mar 21]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK507876/
38. Pocket Book of Hospital Care for Children: Guidelines for the Management of Common Childhood Illnesses. 2nd edition. Geneva: World Health Organization; 2013. 7, Severe acute malnutrition. Available from: https://www.ncbi.nlm.nih.gov/books/NBK154454/
39. Ueda N. Gastroduodenal Perforation and Ulcer Associated With Rotavirus and Norovirus Infections in Japanese Children: A Case Report and Comprehensive Literature Review. Open Forum Infect Dis. 2016; 3 (1): ofw026. doi: 10.1093/ofid/ofw026. PMID: 26989751; PMCID: PMC4794947.
40. Søreide K, Thorsen K, Harrison EM, Bingener J, Møller MH, Ohene-Yeboah M, Søreide JA. Perforated peptic ulcer. Lancet. 2015; 386 (10000): 1288-1298. doi: 10.1016/S0140-6736(15)00276-7. PMID: 26460663; PMCID: PMC4618390.
41. InformedHealth.org [Internet]. Cologne, Germany: Institute for Quality and Efficiency in Health Care (IQWiG); 2006-. Diarrhea: Overview. 2016 May 4 [Updated 2019 Dec 19]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK373090/
42. Jeyarajah S, Purkayastha S. Proctalgia fugax. CMAJ. 2013; 185 (5): 417. doi: 10.1503/cmaj.101613. PMID: 23184844; PMCID: PMC3602260.
43. Carter MJ, Lobo AJ, Travis SPL. Guidelines for the management of inflammatory bowel disease in adults. Gut 2004; 53: v1-v16. Available from: http://dx.doi.org/10.1136/gut.2004.043372
44. Yang XF, Pan K. Diagnosis and management of acute complications in patients with colon cancer: bleeding, obstruction, and perforation. Chin J Cancer Res. 2014; 26 (3): 331-340. doi: 10.3978/j.issn.1000-9604.2014.06.11. PMID: 25035661; PMCID: PMC4076711.
45. Thomas A, Lenox R. Pulmonary lymphangitic carcinomatosis as a primary manifestation of colon cancer in a young adult. CMAJ. 2008; 179 (4): 338-340. doi: 10.1503/cmaj.080142. PMID: 18695182; PMCID: PMC2492966.
46. Pezzuto A, Mariotta S, Fioretti F, Uccini S. Metastasis to the colon from lung cancer presenting with severe hyponatremia and dyspnea in a young male: A case report and review of the literature. Oncol Lett. 2013; 5 (5): 1477-1480. doi: 10.3892/ol.2013.1208. PMID: 23761813; PMCID: PMC3678879.
47. Bunu DM, Timofte CE, Ciocoiu M, Floria M, Tarniceriu CC, Barboi OB, Tanase DM. Cardiovascular Manifestations of Inflammatory Bowel Disease: Pathogenesis, Diagnosis, and Preventive Strategies. Gastroenterol Res Pract. 2019; 2019: 3012509. doi: 10.1155/2019/3012509. PMID: 30733802; PMCID: PMC6348818.
48. Mathur M, D'Souza AV, Malhotra V, Agarwal D, Beniwal P. Uremic frost. Clin Kidney J. 2014; 7 (4): 418-419. doi: 10.1093/ckj/sfu057. PMID: 25852925; PMCID: PMC4377803.
49. Ausavarungnirun R, Wisetsin S, Rongkiettechakorn N, Chaichalermsak S, Udompol U, Rattanasompattikul M. Association of dental and periodontal disease with chronic kidney disease in patients of a single, tertiary care centre in Thailand. BMJ Open. 2016; 6 (7): e011836. doi: 10.1136/bmjopen-2016-011836. PMID: 27466240; PMCID: PMC4964184.
50. Lupi O, Rezende L, Zangrando M, Sessim M, Silveira CB, Sepulcri MAS, Duarte DJ, Cardim P, Fernandes MM, Santos OR. Cutaneous manifestations in end-stage renal disease. An. Bras. Dermatol. 2011, 86 (2): 319-326. Available from: https://doi.org/10.1590/S0365-05962011000200015
51. Diamandopoulos AA, Goudas PC. Substitution of renal function through skin catharsis: evidence from the classical period to the middle ages. Kidney international 2001; 59 (4): 1580-1589. doi: https://doi.org/10.1046/j.1523-1755.2001.0590041580.x
52. Tago M, Furukawa EN, Naito Y, Fukumori N, Sugioka T, et al., (2015) Excessive Sweating is a Predictive Factor for Serious Consequences of Rhabdomyolysis Not Requiring Renal Replacement Therapies on Admission. Gen Med (Los Angel) 3: 1000210. doi: 10.4172/2327-5146.1000210
53. Taghavi S, Askari R. Hypovolemic Shock. [Updated 2019 Jun 18]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK513297/
54. Hui D, dos Santos R, Chisholm G, Bansal S, Silva TB, Kilgore K, Crovador CS, Yu X, Swartz MD, Perez-Cruz PE, Leite Rde A, Nascimento MS, Reddy S, Seriaco F, Yennu S, Paiva CE, Dev R, Hall S, Fajardo J, Bruera E. Clinical signs of impending death in cancer patients. Oncologist. 2014; 19 (6): 681-687. doi: 10.1634/theoncologist.2013-0457. PMID: 24760709; PMCID: PMC4041673.

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ANU JYOTEEYAM OF CHARAKA INDRIYA STHANA - AN EXPLORATIVE STUDY

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REVIEW ARTICLE

ANU JYOTEEYAM OF *CHARAKA INDRIYA STHANA* - AN EXPLORATIVE STUDY

Abstract:
The *Charaka samhita* (an ancient Indian textbook of medicine written by *Agnivesha*, edited and elaborated by *Charaka* & *Dridhabala*), as available in its present form consists of 8 '*Sthanas*' (sections) and '*Indriya sthana*' (section which deals with prognosis) is one among them. '*Indriya sthana*' deals with prognostication of life expectancy or estimating survival time frames and alerts the physician towards early identification of fatal conditions based on '*Arishta lakshanas'*. *Indriya sthana* of *Charaka samhita* consists 12 chapters and '*Anu jyoteeyam indriyam*' is the 11th chapter of *Indriya sthana*. '*Anu jyoteeyam indriyam*' chapter contains various *arishta lakshanas* which leads to death within a certain period of time (3 months or 6 months or one year). Some unique concepts like medical ethics & etiquette and hygienic precautions for the physician, '*arishta lakshanas'* related to bad fortunes and the definition of '*arishta lakshanas*' etc are explained in this chapter. The present study is aimed to explore the contents of this chapter and to analyse their role and potential in clinical prognostication. Most of the conditions explained in this chapter denote advanced stages of dementia and delirium. Some conditions mentioned in this chapter denote trichotillomania, neurodegenerative, neuromuscular and autoimmune diseases. Description of pathological features like 'Asomatognosia', 'Autotopagnosia', 'Motor apraxia', 'Agnosia', 'Prosopagnosia', 'Hallucinations', 'Finger agnosia', 'Anger in a dying patient' and 'Exploratory procedures' (EPs) etc are unique of this chapter. Prospective longitudinal cohort studies, retrospective cohort studies, cross sectional studies or surveys, and observational type of studies are required to substantiate the claims made in this chapter. 'Positive predictive value' of '*Arishta lakshanas*' mentioned all over '*Indriya sthana*' needs to be calculated.

Key Words: Agnosia, Delirium, Dementia, Exploratory procedures, Hallucinations, Trichotillomania

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INTRODUCTION:

The *Charaka samhita* (an ancient Indian textbook of medicine written by *Agnivesha*, edited and elaborated by *Charaka* & *Dridhabala*), as available in its present form consists of 8 '*Sthanas'* (sections) and '*Indriya sthana*' (section which deals with prognosis) is one among them. [1] To estimate the prognosis of diseases, Ayurveda has described *'Arishta lakshanas'* (fatal signs and symptoms which denotes imminent death). *Indriya sthana* is helpful to identify *'Arishta lakshanas'* and to estimate prognosis based on them. Chakrapani (commentator on Charaka samhita) has stated that, physician should initiate treatment only for those conditions which are having good prognosis or treatable. The word '*Indra'* denotes life *(prana)*. '*Indriya sthana*' deals with prognostication of life expectancy or estimating survival time frames and alerts the physician towards early identification of fatal conditions based on '*Arishta lakshanas'*. [2]

Indriya sthana of *Charaka samhita* contain 12 chapters and '*Anu jyoteeyam indriyam*' is the 11th chapter of *Indriya sthana*. '*Anu jyoteeyam indriyam*' chapter contains various *arishta lakshanas* which leads to death within a certain period of time (6 months or one year) (कालविशेषनियतारिष्टाभिधायकमणुज्योतीयमुच्यते). Some unique concepts like medical ethics & etiquette and hygienic precautions (नैषामन्नानि भुञ्जीत) for the physician, '*arishta lakshanas'* related to bad fortunes (बलिं बलिभृतो & विनिमित्तं धनम् प्राप्नोति etc) and the definition of '*arishta lakshanas*' (क्रियापथमतिक्रान्ताः) etc are explained in this chapter. [3] The present study is aimed to explore the contents of this chapter (Table 1 & 2) and to analyse their role and potential in clinical prognostication in present era.

MAIN CONTENTS:

अणुज्योतिरनेकाग्रो दुश्छायो दुर्मनाः सदा। रतिं न लभते परलोकं समान्तरम्॥

Anu jyoti --- samaantaram [*Verse* 3] [3]

ज्योतिः सकलशरीरान्तर्गतं तेजः। अणुज्योतिर्मन्दाग्निः। अनेकाग्रः व्याकुलचित्तः। दुर्मना इत्यनेन तु मनोदौर्बल्यमुच्यते॥

Jyoti --- uchyate [*Chakrapani*, *Verse* 3] [3]

Behavioural and psychological symptoms of dementia (BPSD) are complications (परलोकं समान्तरम्) of dementia. The most common symptoms of BPSD are agitation (रतिं न लभते), apathy (दुर्मनाः), aggression, psychosis, hallucinations and delusions, wandering, hoarding, inappropriate behaviours (sexual disinhibition and eating inappropriate objects etc), repetitive behaviour and restlessness (doesn't respond well to treatment) (रतिं न लभते). The six cognitive domains affected by dementia are learning and memory, language, complex attention (अनेकाग्रः), executive function, perceptual-motor and social cognition. The neurocognitive disorder (includes dementia, delirium, amnestic disorder and other

cognitive disorders) is classified as mild or major, depending on the severity of symptoms. [4]

Delirium is one of the most common neuropsychiatric problems in patients with advanced cancer and it is prevalent at the end of life (परलोकं समान्तरम्). Delirium is usually irreversible (due to multi-organ failure). Metabolic causes (leads to अणुज्योति) of delirium may occur in up to 18% of terminally ill patients with cancer. Inattention (अनेकाग्रः), disorientation and altered levels of consciousness such as hyper alertness (अनेकाग्रः), lethargic, stupor or comatose (मनोदौर्बल्यम्) etc are seen in Delirium. 'Hypoactive subtype' delirium is characterized by slowed psychomotor function, lethargy and reduced awareness or interaction (मनोदौर्बल्यम्) with the environment whereas 'Hyperactive (agitated) delirium' *is* characterised by increased motor activity with agitation (रतिं न लभते), hallucinations and inappropriate behaviour. Alternating between agitated and quiet forms of delirium suggests 'Mixed type'.[5] The major NCDs (neurocognitive disorders) are classified by diagnoses, including Alzheimer's dementia (AD), frontotemporal lobar degeneration, Lewy body disease, vascular disease, traumatic brain injury, substance or medication use, HIV infection, prion disease, Parkinson's disease, Huntington's disease, another medical condition, multiple etiologies, and unspecified. The most common major NCDs are AD, vascular dementia (VaD), dementia with Lewy body (DLB), and frontotemporal lobar degeneration. Major NCDs are characterized by cognitive decline (मनोदौर्बल्यम्) in one or more cognitive domains. [6] The above verse denotes major NCDs.

बलिं बलिभृतो यस्य प्रणीतं नोपभुञ्जते। लोकान्तरगतः पिण्डं भुङ्क्ते संवत्सरेण सः॥
सप्तर्षीणां समीपस्थां यो न पश्यत्यरुन्धतीम्। संवत्सरान्ते जन्तुः स संपश्यति महत्तमः॥
विकृत्या विनिमित्तं यः शोभामुपचयं धनम्। प्राप्नोत्यतो वा विभ्रंशं समान्तं तस्य जीवितम्॥

Balim --- jeevitam [*Verse* 4-6] [3]

लेखाभिश्चन्द्रवकाभिर्ललाटमुपचीयते। यस्य तस्यायुषः षड्भिर्मासैरन्तं समादिशेत्॥

Lekhaabhi --- samaadishet [*Verse* 9] [3]

ललाटे मूर्ध्नि वस्तौ वा नीला यस्य प्रकाशते। राजी बालेन्दुकुटिला न स जीवितुमर्हति॥

Lalaate --- marhati [*Verse* 13] [3]

विभ्रंशमिति शोभाद्यभावम्। [*Chakrapani, Verse* 13] [3]

The above verses are related to various good and bad omens and they can be explained only through '*Jyotishya shastra*' or '*Nimitta shastra*' or '*Shakuna shastra*'. Jyotishya shastra is a branch of study which deals with the action of planets on human behaviour or life or destiny etc. According to *Jyotishya shastra* past actions (actions of present or previous birth) are the cause for all good and bad fortunes (similar to the '*Karma siddhanta*' or '*Pragnaparadha'* of *Ayurveda*) '*Nimitta shastra'* is an important part of '*samhita khandha'* and deals with various good or bad omens. Hence it can be assumed that omens are the indicators of good or bad or mixed past actions (*Karma*). Our ancient *Acharyas* were well aware of the psychological behaviour of birds and this knowledge can't be achieved without having in depth observation skills. Birds may predict the future of human beings and they can communicate it through their specific behaviour.

Role, significance & practical utility of omens in present era: To approve or disapprove any theory or concept or claim, evidence with well-planned research protocols are required. *Ayurveda* has clearly mentioned that, '*Karma'* is one of the factors in the manifestation of diseases as well as their prognosis. The physician should avoid such type of cases to treat in which *arishta lakshanas* have manifested and bad omens are found. In contemporary science also there are plenty of conditions which come under the category of 'Idiopathic' or 'Cryptogenic' or 'SWAN' (syndromes without a name) etc (in which the cause is unknown). The word 'विकृत्या विनिमित्तं यः' indicates sudden or spontaneous changes in person's life (manifestation of a disease / loss or gain of property, power) without the trace of any underlying disease or without any traceable medical cause (which doesn't mean absence of the cause). When physician come across such type of *arishta lakshanas* related to bad omens, he should be extra vigilant and follow up the patient for long time though patient is healthy.

भक्तिः शीलं स्मृतिस्त्यागो बुध्दिर्बलमहेतुकम्। षडेतानि निवर्तन्ते षड्भिर्मासैर्मरिष्यतः॥ (Ch. I. 11 / 7)

Bhakti --- marishyata [*Verse* 7] [3]

भक्तिः इच्छा।

Bhakti ichha [*Chakrapani, Verse* 7] [3]

Alzheimer's disease (AD) and related dementias (ADRD) take a substantial emotional toll on both the patient and the family of the person with dementia. BPSD (behavioural and psychological symptoms of dementia), also referred to as neuropsychiatric symptoms of dementia (decreased memory / स्मृति), are heterogeneous. BPSD are typically described as disturbances in psychological functioning (decline in cognitive functions / बुध्दि), perception (decline in cognitive functions / बुध्दि), motor function, circadian rhythms, and eating behaviours. Common symptoms include depression, apathy, elation, and delusions (psychological disturbances), hallucinations (perceptual disturbances), wandering, repetitive purposeless behaviours, verbal aggression (personality changes / शीलम्), and physical aggression (motor function disturbances also referred to as agitation) (personality changes / शीलम्), change in sleep patterns (circadian rhythm disturbances), and loss or increase in appetite (eating behaviour disturbances) (personality

changes / भक्तिः or इच्छा). [7] Individuals suffering from dementia experience changes in cognition (बुध्दि), function (बलम्) and behaviour (शीलम्). The clinical presentation of dementia varies greatly among individuals, and the cognitive deficits (बुध्दि) it causes can present as memory loss (स्मृति), communication and language impairments, agnosia (inability to recognize objects), apraxia (inability to perform previously learned tasks) and impaired executive function (reasoning, judgement and planning) (बलम्). More personality changes (शीलम्) are observed in FTD (frontotemporal dementia). [4] The adjusted median survival in advanced dementia was 478 days, and the probability of death within 6 months (षड्भिर्मासैर्मरिष्यतः) was 24.7%. [8] The above verse denotes major NCDs (neurocognitive disorders).

धमनीनामपूर्वाणां जालमत्यर्थशोभनम्। ललाटे दृश्यते यस्य षण्मासान्न स जीवति॥

Dhamaninaam --- sa jeevati [*Verse* 8] [3]

The blood supply to the forehead is provided by the supraorbital and supratrochlear arteries, both originating from the ophthalmic artery. The frontal branch of the superficial temporal artery supplies the lateral part of the forehead (ललाटे दृश्यते) and frequently forms anastomoses with the supraorbital and supratrochlear arteries. The facial artery had a greater tendency to tortuosity, and that the severity of tortuosity was positively correlated with age. The underlying causes of arterial tortuosity (जालम्) include increase in diameter and elongation of arteries as a result of reduced elasticity and arterial hypertension. [9] Clinical observations have linked tortuous arteries and veins (धमनीनाम् जालम्) with aging, atherosclerosis, hypertension, genetic defects, 'Arterial tortuosity syndrome' (ATS) and diabetes mellitus. Various phenotypes of tortuous vessels are curving or curling, twisting, angulation, looping and kinking vessels. Severely tortuous arteries can hinder the blood flow and lead to a transit ischemic attack (न स जीवति) of distal organs. Hypertensive pressure is a major risk factor for artery tortuosity. [10]

With age, degenerative changes and atrophy of the smooth muscle in the vein wall result in susceptibility to dilatation. Untreated venous insufficiency may lead to superficial thrombophlebitis. Telangiectasias may have a variety of appearances including stellate, sunburst, and even arborizing patterns (जालम्) of dilated veins. Progressive fibrosis of the skin and subcutaneous tissues induced by chronic venous hypertension is referred to as lipodermatosclerosis and it is characterized by stiff and shiny skin (अत्यर्थशोभनम्) that is fixed, hard, and indurated, contracting the subcutaneous tissues. [11] The above verse denotes various conditions like polyarteritis, temporal arteritis, ATS, malignant hypertension, telangiectasias and various other vascular associated with thrombosis or embolism or aneurysms etc complications.

शरीरकम्पः संमोहो गतिर्वचनमेव च। मत्तस्येवोपलभ्यन्ते यस्य मासं न जीवति॥

Sharira kampa --- na jeevati [*Verse* 10] [3]

Intention tremor (शरीरकम्पः), Gait ataxia (मत्तस्येव गति), Sensory ataxia (मत्तस्येव गति), Limb ataxia and Dysarthria (संमोहो) are some of the clinical terms often used to describe Ataxia. Symptoms of Ataxia include impairment of consciousness (संमोहो), visual changes, trouble speaking (मत्तस्येव वचनम्) and swallowing, focal sensory loss / weakness, vertigo, slow and abnormal movements (मत्तस्येव गति), cognitive impairment (संमोहो), and behavioural changes. Facial droop, diplopia, pupillary defects, tongue deviation, dysarthria (मत्तस्येव वचनम्), and dysphonia (मत्तस्येव वचनम्) suggest stroke, tumours, or demyelinating disease (न जीवति). Cognitive impairment and hallucinations suggest Wernicke-Korsakoff syndrome, intoxication (मत्तस्येवोपलभ्यन्ते), or poisoning. [12]

Parkinsonism comprises of a clinical syndrome that presents with variety of symptoms that include bradykinesia, tremor (शरीरकम्पः), and unstable posture (मत्तस्येव गति), and profound gait impairment (मत्तस्येव गति). These symptoms are also seen in other neurodegenerative disorders, brain lesions, head trauma, medications, metabolic conditions, and toxin exposure. Parkinsonism is characteristically present in Parkinson disease (PD). Parkinson-plus syndromes are multiple system atrophy, cortical-basal ganglionic degeneration, progressive supranuclear palsy, Shy-Drager syndrome and progressive pallidal atrophy. Dementia with Lewy bodies (DLB) has features of both cognitive dysfunction (संमोह) and Parkinsonism. [13] The above verse denotes Ataxia, PD, delirium, Wernicke-Korsakoff syndrome, neurodegenerative and demyelinating diseases.

रेतोमूत्रपुरीषाणि यस्य मज्जन्ति चाम्भसि। स मासात् स्वजनद्वेष्टा मृत्युवारिणि मज्जति॥

Reto mutra --- majjati [*Verse* 11] [3]

रेतसः अम्भसि मज्जति (*Retasa ambhasi majjati*):

Pyospermia (pus and high WBC concentrations in the semen) indicates an infection. [14] Hematospermia or hemospermia (blood in the seminal fluid), is a potentially alarming occurrence. Recurring or chronic hematospermia is due to various conditions like prostatitis, polyps, cysts, stones, telangiectasias, varices, carcinoma, sarcoma, malacoplakia, condylomas, hemangiomas, strictures, utricular cysts, infections, trauma, lymphoma, leukemia, epididymo-orchitis, testicular tumours and idiopathic. [15] Various

abnormal components of semen like blood and pus cells etc in the semen may increase the specific gravity of semen and leads to 'अम्भसि मज्जति'.

मूत्रं अम्भसि मज्जति (*Mutram ambhasi majjati*):

The specific gravity of the urine is an accurate measure of the number of dissolved particles within it. If the volume of urine is decreased, the dissolved substances will be more concentrated, and the specific gravity of the urine will be high. Albumen in the urine may cause high specific gravity values. In cardiac decompensation, the blood chemistry values may be increased, and the urine contain albumin and casts. [16] Urine specific gravity (USG) measures the concentration of particles in urine and the density of urine compared with the density of water. Measuring USG is an easy and convenient way to gauge a patient's hydration status as well as the functional ability of his kidneys. Increased USG is found in conditions like excessive water loss or dehydration, diabetes mellitus, inappropriate secretion of antidiuretic hormone (ADH), and congestive heart failure (CHF). [17] Hence constituents like albumin, sugar, pus, blood cells or other abnormal particles increases USG and leads to 'अम्भसि मज्जति'.

पुरीषं अम्भसि मज्जति (*Purisham ambhasi majjati*):

Stool should also be macroscopically checked in terms of colour, consistency, quantity, shape, odour and mucus. The presence of copious mucus or bloody mucus in stool is abnormal. [18] Constipation (hard stool) is a significant problem found in many cancer patients. [19] Various abnormal components of stool increase the specific gravity or hardness or weight of the stool in vide variety of conditions like pancreatic or intestinal diseases, carcinomas of gastrointestinal tract, ulcerative colitis and megacolon etc, which leads to 'अम्भसि मज्जति'. The above verse indicates increased density of the semen, urine and faeces due to various underlying pathologies and indicates diseases of genital (male), urinary and gastrointestinal tracts.

हस्तपादं मुखं चोभे विशेषाद्यस्य शुष्यतः। शूयेते वा विना देहात् स च मासं न जीवति॥

Hasta paadam --- na jeevati [*Verse* 12] [3]

Progressive acquired or hereditary neuromuscular diseases (NMDs) are disorders caused by an abnormality of any component of the lower motor neuron (anterior horn cell), peripheral nerve, neuromuscular junction (pre-synaptic or post-synaptic region), or muscle. Patients with NMDs presents with strength loss, fatigue, falls, difficulty ascending stairs, exercise intolerance, episodic weakness, muscle cramps, focal wasting of muscle groups (हस्तपादं मुखं विशेषाद्यस्य शुष्यतः), breathing difficulties and bulbar symptoms. The adult with 'Myotonic muscular dystrophy' often has facial features like long thin face with temporal and masseter wasting is drawn (मुखं विशेषाद्यस्य शुष्यतः). Facial muscles may also get involved in Charcot-Marie-Tooth neuropathy (CMT), Facial scapulohumeral muscular dystrophy (FSHD), Emery-Dreifuss muscular dystrophy (EMD), Paramyotonia congenita etc conditions. Muscle wasting or atrophy or weakness of hands and feet (हस्तपादं विशेषाद्यस्य शुष्यतः) can be seen in various distal myopathies and peripheral neuropathies. 'हस्तपादं मुखं चोभे विशेषाद्यस्य शुष्यतः' denotes various NMDs (myopathies and neuropathies). [20]

General puffiness or swelling caused by water retention Signs of this kind of edema include puffiness of the hands, feet and face (हस्तपादं मुखं चोभे विशेषाद्यस्य शूयेते). This kind of edema is temporary and goes away without treatment. It can happen because you have been standing or sitting for too long. Edema is common after a long flight, for example, or in people who have to stand for long periods at work. Many women experience edema during their monthly period (menstruation) or during pregnancy. Edema in pregnancy is usually harmless, although it can be a sign of other problems if blood pressure is also high. [21] Angioedema refers to abrupt nonpitting swelling of the skin, mucous membranes, or both, including the upper respiratory and gastrointestinal tracts, which typically lasts from many hours to 3 days. The involved tissues then return to normal. Sites of predilection include the face, hands, feet, (हस्तपादं मुखं चोभे विशेषाद्यस्य शूयेते) and genitalia. Lip and eye (periorbital) swelling are the most common. Swelling of the tongue, pharynx, and larynx is particularly problematic. Fatalities can occur because of laryngeal edema, but pharyngeal edema and tongue swelling can be similarly disastrous if they are massive. [22] Acute angioedema is most often due to an immunoglobulin E (IgE)-mediated response to an inciting allergen and is classified as a type I hypersensitivity reaction. In a patient, swelling of hands and feet (हस्तपादं विशेषाद्यस्य शूयेते) has mimicked angioedema and hepatomegaly, but later diagnosed as erythropoietic protoporphyria (EPP). [23] The above verse may also denote hepatic, cardiac or renal oedema or malignant diseases.

प्रवालगुटिकाभासा यस्य गात्रे मसूरिकाः। उत्पद्याशु विनश्यन्ति न चिरात् स विनश्यति॥

Pravaala --- vinashyati [*Verse* 14] [3]

The above verse denotes reddish skin lesions (papules) which disappear spontaneously after their manifestation with high mortality rate. Various conditions like Erysipelas, [24] Acute hemorrhagic oedema of infancy (AHEI) or Finkelstein-Seidlmayer disease, [25] skin rashes with febrile illness (measles, rubella, exanthema subitum, erythema infectiosum, enteroviral infections, acute infectious mononucleosis, Gianotti-Crosti syndrome, Papular-purpuric gloves and socks syndrome (PPGSS), *Pityriasis rosea* (PR),

Eruptive pseudoangiomatosis, Scarlet fever, Leptospiral infection, Kawasaki disease, Mycoplasma infection, erythema multiforme, Chicken pox, Hand-Foot-Mouth disease, Herpes simplex and zoster, vesicular impetigo, Nonbacterial infectious diseases (Lyme disease, enteroviral infection, adenoviral infection, EB viral infection, and hepatitis viral infection), noninfectious diseases (allergy, vasculitis, and cancer), Viral infections that cause hemorrhagic rash (coxsckievirus A9, echovirus 9, Epstein Barr virus (EBV) , cytomegalo virus (CMV), measles virus, arboviruses, and arenaviruses), meningococcemia or meningoencephalitis, Toxic shock syndrome (TSS), Systemic lupus erythematosus (SLE), bacterial sepsis (pneumococcal, staphylococcal, vibrio, etc), severe viral diseases (hemorrhagic fever, measles, dengue fever, etc), hypersensitivity vasculitis, cholesterol embolic syndrome, typhoid, small pox and various other bacterial or viral or autoimmune or fungal skin conditions.[26] Reticulate dermatoses,[27] secondary syphilitic lesions,[28] lymphoproliferative lesions of the skin,[29] cutaneous polyarteritis nodosa,[30] and petechial and purpuric rashes[31] due to various underlying conditions are also resembles with the description of the above verse. The above verse didn't contain 'fever'; hence it seems that 'Petechial or purpuric rash' is the most suitable description matches to the above verse.

ग्रीवावमर्दो बलवाञ्जिह्वाश्वयथुरेव च। ब्रध्नस्यगलपाकश्च यस्य पक्वं तमादिशेत्॥

Greevavamardo --- tamaadishet [*Verse* 15] [3]

Mumps is an acute, systemic, contagious viral infection characterized by painful swelling of one or both parotid glands. It can also involve other salivary glands, meninges, pancreas, and the gonads. Orchitis (ब्रध्नस्य) is a complication of mumps. The patient may present with facial edema, pain, swelling with earache and difficulty to eat, swallow, and talk with difficulty in opening the mouth (गलपाकश्च). [32] The etiology of lymphadenopathy includes infectious diseases (viral, bacterial, mycobacterial, fungal and parasitic), neoplasms (primary and metastatic malignancies, acute lymphoblastic leukemia, Hodgkin lymphoma, non-Hodgkin lymphoma, neuroblastoma, pediatric acute myelocytic leukemia, rhabdomyosarcoma, metastatic carcinoma of the lungs and viscera, metastatic breast cancer and metastatic thyroid and renal cancers), inflammatory diseases, autoimmune diseases (sarcoidosis, juvenile rheumatoid arthritis, serum sickness and systemic lupus erythematosus), inborn metabolic storage disorders, toxins and some medications. The majority of the lymphadenopathy occurs in the head and neck region. Submandibular nodes typically drain the tongue (जिह्वाश्वयथुरेव), lips and the mouth (गलपाकश्च); Jugular lymphadenopathy typically drains the tongue (जिह्वाश्वयथुरेव), the tonsils (गलपाकश्च), the pinna, and the parotid gland; Posterior cervical adenopathy typically is indicative of scalp, neck (ग्रीवावमर्दो), skin of the arms and legs and Inguinal nodes drain the penis, the scrotum (ब्रध्नस्य), the vulva, vagina, the perineum, the gluteal region. [33]

Various autoimmune diseases (systemic lupus erythematosus (SLE), Sjögren syndrome, pemphigus vulgaris, mucous membrane pemphigoid (MMP), and Behcet disease) may present with oral manifestations. Pemphigus vulgaris may present with lesions at the buccal mucosae (गलपाकश्च), soft palate, lower lip, and tongue (जिह्वाश्वयथुरेव) and gingiva. Oral lesions (गलपाकश्च) can range from superficial ulcers to small vesicles or blisters. In MMP, lesions can also occur in other areas of the oral cavity including the palate, buccal mucosae, lips, tongue (जिह्वाश्वयथुरेव), and pharynx (गलपाकश्च). Mucocutaneous lesions are localized at the lips, buccal mucosa (गलपाकश्च), soft palate, and tongue (जिह्वाश्वयथुरेव) in Behcet disease. The genital ulcers are located at the level of the scrotum (ब्रध्नस्य ?), on the base of the penis, or on the labia majora in Behcet disease. [34] Epstein-Barr virus (EBV) belonging to the Herpes family and the primary cause of infectious mononucleosis (IM). Symptoms of IM (glandular fever) include fever, lymphadenopathy and pharyngitis (गलपाकश्च). White tonsillar exudates, sometimes even covering the tongue (जिह्वाश्वयथुरेव) may be seen and distinguish IM from the more spotted coverings seen in bacterial tonsillitis. Acute complications of IM are splenic rupture, hepatitis and severe tonsil enlargement (बलवाञ्जिह्वाश्वयथुरेव & गलपाकश्च) with airway obstruction. EBV has been associated with various other conditions like lymphoproliferative disorders, head and neck cancer (ग्रीवावमर्दो?), breast cancer, SLE, vitamin D deficiency, chronic fatigue syndrome, thyroid disorders, rheumatoid arthritis (RA), multiple sclerosis (MS) as well as other autoimmune disorders. Concerning malignant disease alone, it has been estimated that EBV is associated with close to 200,000 malignancies (पक्वं तमादिशेत्) worldwide. [35]

संभ्रमोऽतिप्रलापोऽतिभेदोऽस्थामतिदारुणः। कालपाशपरीतस्य त्रयमेतत् प्रवर्तते॥

Sambhramo --- pravartate [*Verse* 16] [3]

Both pain (अतिभेदोऽस्थामतिदारुणः) and delirium (संभ्रमोऽतिप्रलापो) are common problems for older people across a range of clinical settings. Hyperactive subtype of delirium may lead to more breakthrough pain (अतिभेदोऽस्थामतिदारुणः), when compared to other types of delirium (hypoactive & mixed) due to frequent, intense and purposeless movements. Hence, patients with Hyperactive delirium may exacerbate movement related pain (अतिभेदो अस्थामतिदारुणः). [36] In delirium, the disturbance of consciousness (संभ्रमो) is one of the earliest manifestations, which often fluctuates. The patient may

appear obviously drowsy, lethargic, or even semi-comatose in more advanced cases. Typically, there are global or multiple deficits in cognition, including memory impairment and disorientation (संभ्रमो). Disorientation (संभ्रमो) is usually common, first in reference to time and then to place. Another clinical feature is disorganized thinking, manifested by incoherent speech and rambling or irrelevant conversation (अतिप्रलापो), or unclear or illogical flow of ideas. [37] The above verse may also denote AML (acute myeloid leukemia), bone metastasis, delirium in cancer patients, and delirium due to various infections.

प्रमुह्य लुञ्चयेत् केशान् परिगृह्यात्यतीव च। नरः स्वस्थवदाहारमबलः कालचोदितः॥
Pramuhya --- kaalachodita [*Verse* 17] [3]
अबलः सन् स्वस्थवदाहारमत्यर्थं करोतीत्यर्थः।
Abala --- karotityartha [*Chakrapani*, *Verse* 17] [3]
Trichotillomania is a disorder characterized by repetitive hair pulling (लुञ्चयेत् केशान्), leading to hair loss and functional impairment. Trichotillomania is rare in dementia patients and has been reported however, in frontal lobe dementia and vascular dementia. Trichotillomania can manifest with dementia progression and it is probably associated with structural grey matter changes in neural circuitry implicated in habit learning, cognition and affect regulation. [38] Impulsivity is defined as the failure to resist a drive or stimulus, or in a personality dimension as the inability to resist the desire to harm self or others. Impulsivity can be a psychopathological structural part of many mental disorders such as impulse control disorders (pathological gambling, intermittent explosive disorder, kleptomania, pyromania and trichotillomania - लुञ्चयेत् केशान्), impulsive aggressive disorders of personality (borderline, antisocial, histrionic and narcissistic), manic episodes of bipolar disorder, attention deficit hyperactivity disorder (ADHD), neurological disorders with behavioural disinhibition and substance abuse Association of hair pulling (लुञ्चयेत् केशान्) with a white-matter vascular dementia (Binswanger's disease) has been found. [39]

Depression is quite common in FTD (Frontotemporal dementia). Atypical features of major depression like apathy, decreased energy (अबलः), hyperphagia (नरः स्वस्थवदाहारम्?) and inappropriately preserved self-esteem (which are uncommon in typical depression). Significant weight loss (अबलः) when not dieting (नरः स्वस्थवदाहारम्?) is also one of the features of major depression. According to 'Cornell scale for depression in dementia', anxiety, irritability, annoyed, short temperedness, behavioural disturbances like agitation, restlessness, hair pulling and lack of energy (अबलः) are the features of depression in dementia. Transient, unexplained loss of consciousness (प्रमुह्य), repeated falls, syncope (fainting) (प्रमुह्य) and visuospatial abnormalities are the features of 'Lewy body disease'. [40] Delirium in the last few days of life (often referred to as terminal restlessness or terminal agitation) (लुञ्चयेत् केशान् may be due to restlessness or agitation) is often ongoing and irreversible. Hyperactive subtype of delirium is characterized by increased psychomotor activity or agitation or restlessness with inappropriate behaviours. Delirium is characterised by rapidly emerging disturbance of consciousness (प्रमुह्य). [41] The above verse denotes trichotillomania in advanced stages of dementia (vascular or frontotemporal) or agitation in delirium or delirium in various major NCDs (neurocognitive disorders).

समीपे चक्षुषो कृत्वा मृगयेताङ्गुलीकरम्। स्मयतेऽपि च कालान्ध ऊर्ध्वगानिमिषेक्षणः॥
शयनादासनादङ्गात् काष्ठात् कुड्यादथापि वा। असन्मृगायते किञ्चित् स मुह्यन् कालचोदितः॥
Sameepe --- kaalachodita [*Verse* 18-19] [3]
असत् अविद्यमानं शयनासनादि मृगयते प्रार्थयते। स्मयते च विस्मितो भवति॥
Asat --- bhavati [*Chakrapani*, *Verse* 18-19] [3]
Asomatognosia is defined as a patient's feeling that parts of his or her body are "missing" or have disappeared from corporeal awareness. Asomatognosia may be modified by touching (मृगयेताङ्गुलीकरम्) the missing body part or by looking at it (समीपे चक्षुषो कृत्वा), suggesting multisensory mechanisms in awareness and embodiment of body parts. Patients with asomatognosia whose experiences of missing body parts can be corrected by enhanced input from vision, touch (मृगयेताङ्गुलीकरम्), and passive or active body part movements. [42] Somatosensory impairments (स मुह्यन्) are commonly seen in stroke patients. These impairments range from primary deficits in tactile detection, perception of features, haptic object recognition and bodily experiences. A higher level in the hierarchical processing of somatosensory input concerns the discrimination of the haptic features of an object (texture, substance, size, shape, weight and the hardness of a stimulus) (impaired recognition of haptic features of an object - शयनादासनादङ्गात् काष्ठात् कुड्यादथापि वा असन्मृगायते). [43]

Amorphognosia (disorders in discriminating the size or shape of an object), Ahylognosia (disorders in discriminating the texture, weight or thermal properties of objects), Asomatognosia (patients feel that parts of their body are 'missing' or have disappeared from corporal awareness) (मृगयेताङ्गुलीकरम्), Somatoparaphrenia (patients actively deny the ownership of a paralysed hand, arm or foot), and Autotopagnosia (a person is not capable of localizing their own body parts), finger agnosia (unable to identify his own fingers) (मृगयेताङ्गुलीकरम्), tactile apraxia (inability to discriminate haptic object recognition) etc are some somatosessory

impairments (शयनादासनादज्ञात् काष्ठात् कुड्यादथापि वा असन्मृगायते) seen in stroke patients. Different types of hand movements (exploratory procedures or EPs) (मृगयेत्) are used to discriminate a particular dimension (e.g. texture, hardness and weight) of a stimulus. The EPs used depend on the dimension to be discriminated. For example, texture (lateral motion), hardness (by pressing the object). The ability to perform EPs (मृगयेत्) needed for haptic object recognition can be selectively disturbed (असन्मृगायते किञ्चित् स मुह्यन्) in stroke patients. Disorders associated with deficits in embodiment (असन्मृगायते किञ्चित् स मुह्यन्) are seen in extensive right-hemispheric lesions with premotor, parietal and posterior insular damage (कालचोदितः). [43]

Gaze dysfunction is common following stroke. Various gaze abnormalities including impaired gaze holding, complete gaze palsy, horizontal gaze palsy, vertical gaze palsy, Parinaud's syndrome, one and half syndrome, saccadic palsy, and smooth pursuit palsy are seen in stroke patients. Along with ocular abnormalities lid or pupil abnormalities are also seen. Cortical areas (occipital, parietal, and temporal lobes), cerebellum, brainstem, and diencephalic areas are commonly involved in stroke with gaze dysfunction. Vertical gaze palsy / paresis involving both upward (ऊर्ध्वगेक्षणः) and downward gaze with lid retraction (अनिमिषेक्षणः) has been seen in stroke patients. [44]

Cortical blindness (कालान्ध) results in binocular vision loss due to insult to the occipital cortex. Anton-Babinski syndrome (Anton syndrome or ABS) is visual anosognosia (denial of loss of vision) associated with confabulation (defined as the emergence of memories of events and experiences which never took place) in the setting of obvious visual loss (कालान्ध) and cortical blindness. It is essentially neurological visual impairment/disturbance resulting from abnormality or damage in the brain rather than due to eye abnormalities. Various conditions may lead to ABS, like ischemic stroke involving bilateral occipital lobes, MELAS (mitochondrial myopathy, encephalomyopathy, lactic acidosis, and stroke-like episodes), adrenoleukodystrophy, hypertensive encephalopathy, angiitis, progressive multifocal leukoencephalopathy with HIV infection and Multiple sclerosis etc. Though the patient is blind (कालान्ध), he will behave and talk as if he has normal vision. Patients with ABS are found to collide with pieces of furniture, to fall over objects, and to experience difficulty in finding their way around (असत् अविद्यमानं शयनासनादि मृगयते प्रार्थयते). Suspicion is still further alerted when they begin to describe people and objects around them who do not exist (अविद्यमानं शयनासनादि प्रार्थयते). Mental confusion (स मुह्यन्) may also be seen. Patients with ABS may give excuses for their blindness. [45] The above verse denotes various conditions like somatosensory and ocular abnormalities seen in stroke patients, dementia syndromes, neuropathies, spinal cord injuries, ABS and delirium etc.

अहास्यहासी संमुह्यन् प्रलेढि दशनच्छदौ। शीतपादकरोच्छ्वासो यो नरो न स जीवति॥

Ahaasyahaasi --- na sa jeevati [*Verse* 20] [3]

Altered mental status is a common complaint among older emergency department (ED) patients (नरो न स जीवति). The term "altered mental status" has several synonyms such as confusion (संमुह्यन्), not acting right (अहास्यहासी), altered behaviour, generalized weakness, lethargy, agitation, psychosis (अहास्यहासी), disorientation (संमुह्यन्), inappropriate behaviour (अहास्यहासी), inattention, and hallucination (अहास्यहासी). Precipitants for delirium include electrolyte abnormalities (प्रलेढि दशनच्छदौ) such as hyponatremia, hypernatremia, hypercalcemia, and hypocalcemia, organ failure, cerebrovascular accidents, intracerebral hemorrhage, epidural and subdural hematomas, subarachnoid hemorrhage, dehydration (प्रलेढिदशनच्छदौ) and cardiovascular illnesses. Vital sign abnormalities (hypertensive encephalopathy, hypotension, hyperthermia or hypothermia, or hypoxia) etc should be considered while assessing delirium patients. [46] Signs such as restlessness, confusion (संमुह्यन्), agitation, acute hypertension, or ischemic heart changes, arrhythmias and secondary cardiac failure/shock denote severe hypoxaemia with imminent respiratory, cardiac arrest. Cerebral signs (confusion, restlessness, agitation) in HS (hemorrhagic shock) and CS (cardiogenic shock) are indicative of imminent circulatory collapse. Hypothermia (शीतपादकरोच्छ्वासो) accompanies the two vasoconstrictive types of shock and is result of vasoconstriction, hemorrhage, and perioperative heat loss; it is an ominous sign of irreversibility and the most obvious clinical marker of reduced metabolism typical of end-stage shock (नरो न स जीवति) of any etiology. Cold, clammy (शीतपादकरो) and pale skin with increased heart rate and hypothermia is seen in CS. [47] The above verse denotes brain hypoxia or hypoxic and hypotensive encephalopathy.

आह्वयंस्तं समीपस्थं स्वजनं जनमेव वा। महामोहावृतमनाः पश्यन्नपि न पश्यति॥

Aahvayamstam --- na pashyati [*Verse* 21] [3]

Visual agnosia is impairment in identifying visually presented objects (न पश्यति), though having intact normal visual field (पश्यन्नपि), acuity, colour vision, brightness discrimination, language, and memory. It is of two types (apperceptive and associative visual agnosia). Apperceptive visual agnosia (an abnormality in visual perception and discriminative process, despite the absence of elementary visual deficits and seen in

parietal and occipital lesions), Associative visual agnosia (difficulty with understanding the meaning of what they are seeing and seen in bilateral inferior occipitotemporal cortex lesions), Prosopagnosia (inability to recognize familiar faces due to damage of fusiform face area located in the inferior temporal cortex in fusiform gyrus) (आह्वयंस्तं समीपस्थं स्वजनं जनमेव वा न पश्यति), Apperceptive prosopagnosia (can't perceive facial expression and cues but can recognize non-facial clues like hair and clothing), and Associative prosopagnosia (patients can derive some facial information like gender and age) etc are different types of visual agnosias'. [48] The above verse denotes 'Prosopagnosia' and it also denote various other conditions like dementia, aphasia, acute confusional states (delirium) (महामोहावृतमनाः) and attention deficits etc.

अयोगमतियोगं वा शरीरे मतिमान् भिषक्। खादीनां युगपद्दृष्ट्वा भेषजं नावचारयेत्॥
Ayogam --- naavachaarayet [*Verse* 22] [3]
अविद्यमानविषयग्रहणमतियोगः। योग्यविषयाग्रहणमयोगः॥
Avidyamaana --- ayoga [*Chakrapani, Verse* 22] [3]

अयोग *(Ayoga):*

Age-related sensory impairment (योग्यविषयाग्रहणमयोगः) is a slow and gradual progress and it affects multiple modalities. The 'common factor theory' assumes that the loss of several sensory modalities (खादीनाम्) occurs simultaneously whereas 'specific factor theory' predicts that the sensory decline is uncorrelated between different modalities. Older people usually experience a decline in visual acuity due to changes in lens elasticity which leads to a decrease in abilities to focus on near objects (i.e., presbyopia) and to adapt to light. Hearing is also well known to decline with age and is usually characterized by a decreased hearing sensitivity, capability to understand speech in a noisy environment, slowed central processing of acoustic stimuli, and impaired sound localization. Deficits in smell and taste are highly prevalent in older people. Significant age-related decline in vibrotactile sensitivity (somato sensory systems) is also found in older people. Age related decline in each of these sensory systems (sensory deficiency) (श्रोत्रादीनाम् अयोगः) has been well established in the literature. [49] Agnosia is a condition in which patient is unable to recognize and identify objects, persons, or sounds using one or more of their senses (योग्यविषयाग्रहणमयोगः) despite otherwise normally functioning senses. The deficit cannot be explained by memory, attention, language problems, or unfamiliarity to the stimuli. Usually, one of the sensory modalities is affected (visual or auditory or tactile or gustatory or olfactory agnosia) (श्रोत्रादीनाम् अयोगः). [48]

अतियोग *(Atiyoga):*

Hallucinations (अविद्यमानविषयग्रहणम्) are one among the signs, symptoms or premonitions of death (भेषजं नावचारयेत्). Prior research indicates that BPSD (behavioural and psychological symptoms of dementia) such as hallucination, anxiety, irritation and shouting loudly are commonly observed among end-of-life (भेषजं नावचारयेत्) dementia patients. It is possible that these could be distinct features of impending death (भेषजं नावचारयेत्) in elderly people with senile dementia. [50] Hyperactive subtype or Agitated delirium is characterized by inappropriate behaviour and hallucinations. Delirium in the last few days of life (often referred to as terminal restlessness or terminal agitation) (भेषजं नावचारयेत्) is often ongoing and irreversible. [5] Hallucinations (अविद्यमानविषयग्रहणम्) can be defined as 'the intimate conviction of actually perceiving a sensation for which there is no external object' (अविद्यमानविषयग्रहणमतियोगः). Besides Schizophrenia, it is increasingly recognized that hallucinations occur with significant frequency in other psychiatric (post-traumatic stress disorder [PTSD], personality disorders) and medical conditions (neurodegenerative conditions and eye disease) and conditions which especially predictive of multimorbid psychopathology. Hallucinations (अविद्यमानविषयग्रहणम्) can be seen in various conditions causing damage to the peripheral sensory pathways, lesions of afferent visual pathways, thyroid dysfunction, Hashimoto disease, deficiencies in D and B12 vitamins, Prader–Willi syndrome, autoimmune disorders, HIV/AIDS, narcolepsy, tumours, traumatic brain injuries, epilepsy, cardiovascular events, neurodegenerative conditions, Parkinson's disease and dementia with Lewy bodies etc.[51] 'अविद्यमानविषयग्रहणमतियोगः' denote hallucinations whereas 'योग्यविषयाग्रहणमयोगः' denotes sensory impairment or decline or agnosia.

अतिप्रवृध्द्या रोगाणां मनसश्च बलक्षयात्। वासमुत्सृजति क्षिप्रं शरीरी देहशंज्ञकम्॥
Ati pravruddhya --- deha sangnakam [*Verse* 23] [3]

Delirium is prevalent at the end of life, particularly during the final 24–48 hours and it is common among patients with advanced disease (अतिप्रवृध्द्या रोगाणाम्). All patients at the end of life can therefore be considered at high risk of delirium. Delirium presents significant problems and severe distress for the patient (मनसश्च बलक्षयात्). Delirium is characterized by a global disturbance in cerebral function affecting consciousness, attention, cognition and perception (मनसश्च बलक्षयात्). Delirium is irreversible (due to the fact that irreversible processes such as multi-organ failure are occurring) in the last two days of life (वासमुत्सृजति क्षिप्रं शरीरी). [5] Dementia is a progressive, incurable illness (अतिप्रवृध्द्या रोगाणाम्). In patients with advanced dementia, the final year of life is characterized by a trajectory of persistently severe disability. Features of advanced dementia include profound memory deficits (e.g.,

inability to recognize family members) (मनसश्च बलक्षयात्), minimal verbal abilities, inability to ambulate independently, inability to perform any activities of daily living, and urinary and fecal incontinence. Patients with advanced dementia commonly have distressing symptoms (मनसश्च बलक्षयात्). [52] Patients with advanced dementia are being at high risk for death (वासमुत्सृजति क्षिप्रं शरीरी). Discomfort and distressing symptoms (मनसश्च बलक्षयात्) aggravate in advanced dementia patients, especially as the end of life approaches. [8] The above verse denotes dementia or delirium.

वर्णस्वराग्निबलं वागिन्द्रियमनोबलम्। हीयतेऽसुक्षये निद्रा नित्या भवति वा न वा॥

Varna swaram --- bhavati va na va [*Verse* 24] [3]

The main diseases of aged people in end-of-life care are cancer, dementia, and internal organ failure. Signs and symptoms at the end stages of dementia or life are breathing disorder, consciousness decline (delirium), vital power decline (हीयते बलम्) (don't talk (हीयते स्वरम्), can't talk (हीयते वागिन्द्रिय बलम्), increased sleeping time (निद्रा नित्या भवति), and no conversation (हीयते स्वरम्) etc), reduced oral intake (anorexia) (हीयते अग्नि), faeces disorder, calm and peaceful character, blood pressure decline, change in skin colour (skin becomes deadly pale or earth like colour, turns white or pale, and skin colour drains) (हीयते वर्णम्), patient odour, oedema, preagonal vital power, body temperature decline, bedsore/wound deterioration, body weight reduction, cyanosis and oliguria. BPSD (behavioural and psychological symptoms of dementia) (हीयते मनोबलम्) such as hallucination, anxiety, irritation and shouting loudly are commonly observed among end-of-life dementia patients. [50] Delirium is a complex multifactorial syndrome resulting from global organic cerebral dysfunction. Along with disturbances in consciousness, attention and awareness other changes in cognition (हीयते मनोबलम्) may also occur in delirium such as disorientation, memory deficit, disturbances in language (हीयते वागिन्द्रिय बलम्), visuospatial ability, perception, sleep–wake cycle disturbance (निद्रा नित्या भवति वा न वा), delusions, dysarthria (हीयते स्वरम्), dysgraphia, emotional lability (हीयते मनोबलम्), and abnormal psychomotor activity (hypo or hyperactivity). [53] The above verse denotes various conditions like dementia, delirium and cachexia etc.

भिषग्भेषजपानान्नगुरुमित्रद्विषश्चये। वशगाः सर्व एवैते बोध्दव्याः समवर्तिनः॥

Bhishak --- samavartina [*Verse* 25] [3]

Anger (द्विषश्च) is a predictable part of the dying process (समवर्तिनः). Angry patients (द्विषश्च) frequently try to blame someone (भिषग्भेषजपानान्नगुरुमित्रादि) for their disposition. They succeed when they transfer ownership for their emotional state to someone else (this coping style is called as *projection).* Patients who project their anger are difficult to engage. The process of dying is not isolated to the patient only and it is also a family and social process. The old unresolved family conflicts may present as inappropriate patient anger toward the physician, staff, and family (भिषग्भेषज पानान्नगुरुमित्रादि). The angry dying patient is a challenge for any clinician. [54] The first mental stage in a dying person (समवर्तिनः) is denial and isolation. The second stage is anger when the patient expresses his or her anxiety through anger or other emotions (द्विषश्च). [55] The above verse denotes 'Projection' of emotional stress as anger by a dying patient on someone others like physician or family members or relatives or friends etc.

एतेषु रोगः क्रमते भेषजं प्रतिहन्यते। नैषामन्नानि भुञ्जीत न चोदकमपि स्पृशेत्॥

Eteshu --- sprushet [*Verse* 26] [3]

नैषामन्नानि भुञ्जीतेति प्रायेण तदन्नस्याविशुध्दत्वात्। एवमुदकप्रतिषेधेऽपि बोध्यम्॥

Naishamannani --- bodhyam [*Chakrapani, Verse* 26] [3]

Physician should never accept a gift from a patient who has been suffering with a progressive and untreatable disease (एतेषु रोगः). Physician shouldn't accept the food and drinks (नैषामन्नानि भुञ्जीत न चोदकमपि स्पृशेत्) also from such type of patients as a hygienic protocol or to prevent the transmission of infectious diseases (तदन्नस्याविशुध्दत्वात्) from patient to self. Gift giving has been quite common in clinical practice. The decision about whether to accept gifts might be influenced by factors such as the nature and longevity of the physician-patient relationship; the cost, type, and timing of the gift; and the apparent motivation behind giving it. Physician should not accept the gift (नैषाम्) given by Patients having intentions such as 'to procure preferential treatment' or 'to seek inappropriate attention' or seeking 'short cut methods' etc. Gifts given "out of the blue" should merit particular scrutiny, as they could suggest that the patient might expect more than the standard of care in the future. Selective acceptance (or conditional acceptance) acknowledges the benefits of accepting gifts from patients while applying criteria that evaluate the potential for unethical implications of gift giving. [56] The above verse denotes the code of conduct or professional ethics or etiquette of physicians during *samhita* period.

पादाः समेताश्चत्वारः संपन्नाः साधकैर्गुणैः। व्यर्था गतायुषो द्रव्यं विना नास्ति गुणोदयः॥

Paadaa --- gunodaya [*Verse* 27] [3]

Four basic components are mentioned in *Ayurveda* for treating patients successfully (पादाः समेताश्चत्वारः संपन्नाः). They are 'Physician', 'Medicine', 'Care taker' and 'Patient having the desired qualities'. But these four components can't prevent the death (व्यर्था) of the patient who possess '*Arishta lakshanas*' or who is at the end

stages of his life (गतायुषो). It means that, physician should not attempt to treat such type of patients who had '*arishta lakshanas*' (though the patient is having all the resources required for successful treatment) (व्यर्था) as the underlying pathology is irreversible and patient definitely going to die (गतायुषो).

परीक्ष्यमायुर्भिषजा नीरुजस्यातुरस्य च। आयुज्ञानफलं कृत्स्नमायुर्ह्रे ह्यनुवर्तते॥

Pareekshya --- hyanuvartate [*Verse* 28] [3]

Estimation of life expectancy (परीक्ष्यमायुः) serves an important role in clinical decisions (कृत्स्नमायुर्ह्रे ह्यनुवर्तते) about screening for disease and treatment in primary care practices. Life expectancy calculators based on readily available electronic data that have acceptable performance for estimating one, 5, and 10 year life expectancy in middle age to older adults are feasible (आयुज्ञानफलम्). Most currently available life expectancy calculators or life tables are based on a person's age, gender, and race. Clinicians usually consider other key factors such as the presence and severity of life-threatening diseases and functional status. [57] Various indices like 'Life expectancy' (परीक्ष्यमायुः आतुरस्य च), 'Health expectancy', 'Life span', 'Health span' (नीरुजस्य) and 'Health adjusted life expectancy' etc are available now a days to calculate or to assess the remaining life span or health status or prognosis and based on which clinical decisions or treatment planning can be done accordingly. The physician should be aware of various *arishta lakshanas* and pathological features explained in '*Indriya sthana*' and should properly assess the life expectancy of the patient which helps in clinical decision making.

क्रियापथमतिक्रान्ताः केवलं देहमाप्लुताः। चिह्नं कुर्वन्ति यद्दोह्रास्तदरिष्टं निरुच्यते॥

Kriyapatham --- niruchyate [*Verse* 29] [3]

निर्निमित्तत्वं हि अनुपलभ्यमाननिमित्तत्वमुक्तं।

Nirnimittatvam --- uktam [*Chakrapani*, *Verse* 29] [3]

Any signs or symptoms which occur due to the morbidly aggravated *doshas* throughout the body and irreversible as well as unresponsive to treatment should be considered as '*Arishta lakshanas*'. As patients approach the last days of their lives, they experience a multitude of physiological changes (*Arishta lakshanas*) affecting their neurocognitive, cardiovascular, respiratory, muscular function. These bodily changes (केवलं देहमाप्लुताः) may be observed at the bedside (चिह्नं कुर्वन्ति), and may assist clinicians in establishing the diagnosis of impending death (i.e. death within days) (तदरिष्टम्). Ten target signs which indicate impending death have been reported in the literature (i.e. apnea periods, Cheyne Stokes breathing, death rattle, dysphagia of liquids, decreased level of consciousness, palliative performance scale ≤20%, peripheral cyanosis, pulselessness of radial artery, respiration with mandibular movement, and decreased urine output). The ability to make the diagnosis of impending death with confidence is of great importance to clinicians who attend to patients at the end-of-life, because it could affect their communication with patients and families, inform complex decision making such as discontinuation of investigations, discharge planning and enrollment on clinical care pathways. [58] The word 'निर्निमित्तत्वम्' denotes obscure (अनुपलभ्यमानम्) or hidden cause (not mere absence of cause).

CONCLUSION:

'कालविशेषनियतारिष्टलक्षणानि' (signs and symptoms indicating impending death within a specified period of time like 3 months, 6 months or 1 year etc) are explained in this chapter. Most of the conditions mentioned in this chapter denote advanced stages of dementia and delirium. 'रेतोमूत्रपुरीषाणि मज्जन्ति चाम्भसि' etc laboratory examination procedures are explained in this chapter which are significant in prognostic assessment. Some conditions mentioned in this chapter denote trichotillomania, neurodegenerative, neuromuscular and autoimmune diseases. Description of pathological features like 'Asomatognosia', 'Autotopagnosia', 'Motor apraxia', 'agnosia', 'prosopagnosia', 'hallucinations', 'finger agnosia', 'anger in a dying patient' and 'exploratory procedures' (EPs) etc are unique to this chapter. Some points related to medical ethics or etiquette or code of conduct (नैषामन्नानि भुञ्जीत) are also mentioned in this chapter. Various '*Arishta lakshanas*' related to '*Jyotishya shastra*' or '*Nimitta shastra*' or '*Shakuna shastra*' are explained in this chapter. Definition of 'Arishta lakshanas' is mentioned at the end of the chapter; the word 'निर्निमित्तत्वम्' denotes obscure (अनुपलभ्यमानम्) or hidden cause (not mere absence of cause) behind the manifestation of *arishta lakshanas*.

Prospective longitudinal cohort studies, retrospective cohort studies, cross sectional studies or surveys, and observational type of studies are required to substantiate the claims made in this chapter. Various life expectancy scales, prognostic calculators, health expectancy scales, and other questionnaires or scales or calculators or instruments should be developed according to *Ayurveda* based on the information provided in '*Indriya sthana*'. '*Ayurvedic* target signs' should be identified and developed (based on the *arishta lakshanas*) which indicates impending death. Standardization of *Ayurvedic* clinical examination procedures like 'रेतोमूत्रपुरीषाणि मज्जन्ति चाम्भसि' etc should be done. 'Positive predictive value' of '*Arishta lakshanas*' mentioned all over '*Indriya sthana*' should be calculated.

Table 1: Various *Arishta lakshanas* (Part-1)

Arishta lakshana	Relevant disease or pathology
अणुज्योति ---- समान्तरम् *Anujyoti -- samaantaram* (Ch. I. 11 / 3)	BPSD (behavioural and psychological symptoms of dementia); Delirium;
बलिं बलिभृतो ---- तस्य जीवितम् *Balim -- jeevitam* (Ch. I. 11 / 4-6) लेखाभिश्चन्द्र ---- समादिशेत् *Lekhaabhi -- samaadishet* (Ch. I. 11 / 9) ललाटे मूर्ध्नि ---- जीवितुमर्हति *Lalaate -- jeevitumarhati* (Ch. I. 11 / 13)	*Jyotishya shastra; Shakuna shastra; Nimitta shastra;*
भक्तिः ---- षड्भिर्मासैर्मरिष्यतः *Bhakti -- marishyata* (Ch. I. 11 / 7)	Frontotemporal dementia; Vascular dementia; Alzheimer's dementia; BPSD; Major neurocognitive disorders (NCDs);
धमनीनाम् ---- न स जीवति *Dhamaninaam -- jeevati* (Ch. I. 11 / 8)	Arterial tortuosity syndrome (ATS); Temporal arteritis; Malignant hypertension; Telangiectasia;
शरीरकम्पः ---- जीवति *Shrira kampa -- jeevati* (Ch. I. 11 / 10)	Wernicke-Korsakoff syndrome; Ataxia; Parkinson disease (PD); Dementia with Lewy bodies (DLB); Demyelinating diseases;
रेतोमूत्र ---- मज्जति *Retomutra -- majjati* (Ch. I. 11 / 11)	Various infectious, neoplastic pathologies of male genital, urinary and gastrointestinal tracts;
हस्तपादं ---- जीवति *Hastapaadam -- jeevati* (Ch. I. 11 / 12)	Progressive, acquired neuromuscular diseases (NMDs); Myopathies; Neuropathies; Angioedema; Erythropoeitic protoporphria (EPP); Hepatic, cardiac and renal edema;
प्रवालगुटिकाभासा ---- स विनश्यति *Pravaala -- sa vinashyati* (Ch. I. 11 / 14)	Petechial or purpuric rash; Viral infections;
ग्रीवावमर्दो ---- तमादिशेत् *Greevavamardo -- tamaadishet* (Ch. I. 11 / 15)	Mumps orchitis; Lymphadenopathy; Epstein-Barr virus (EBV); Autoimmune diseases;
संभ्रमोऽति ---- प्रवर्तते *Sambhramo -- pravartate* (Ch. I. 11 / 16)	Delirium; Bone metastasis; Acute myeloid leukemia (AML);

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

Table 2: Various *Arishta lakshanas* (Part-2)

Arishta lakshana	Relevant disease or pathology
प्रमुह्य ---- कालचोदितः *Pramuhya -- kaalachodita* (Ch. I. 11 / 17)	Trichotillomania; Frontotemporal dementia; Vascular dementia; Lewy body disease; Delirium; Major neurocognitive disorders (NCDs);
समीपे ---- कालचोदितः *Sameepe -- kaalachodita* (Ch. I. 11 / 18-19)	Asomatognosia; Autotopagnosia; Motor apraxia; Finger agnosia; Exploratory procedures (EPs); Brain stem vascular lesions; ABS (Anton-Babinski syndrome); Delirium;
अहास्यहासी ---- न स जीवति *Ahaasyahaasi -- na sa jeevati* (Ch. I. 11 / 20)	Delirium; Hemorrhagic shock; Cardiogenic shock;
आह्वयंस्तं ---- न पश्यति *Aahvayamstam -- na pashyati* (Ch. I. 11 / 21)	Prosopagnosia; Visual agnosia; Dementia; Delirium;
अयोगमतियोगं ---- नावचारयेत *Ayogam -- naavachaarayet* (Ch. I. 11 / 22)	Age related sensory impairment or decline; Hallucinations;
अतिप्रवृध्द्या ---- देहशंज्ञकम् *Ati pravruddha -- deha sangnakam* (Ch. I. 11 / 23)	Delirium; Dementia;
वर्णस्वराग्निबलं ----भवति वा न वा *Varnaswara -- bhavati va na vaa* (Ch. I. 11 / 24)	Delirium; Dementia; End of life stages;
भिषग्भेषजपान ---- समवर्तिनः *Bhishak -- samavartina* (Ch. I. 11 / 25)	'Anger' in second stage of a dying process; Projection of anger in a dying patient;
एतेषु रोगः ---- न चोदकमपि स्पृशेत् *Eteshu roga -- na chodakamapi sprushet* (Ch. I. 11 / 26)	Medical ethics; Clinical etiquette; Code of conduct;
परीक्ष्यमायुर्भिषजा ---- ह्यनुवर्तते *Parikshyamayu -- hyanuvartate* (Ch. I. 11 / 28)	Estimation of life expectancy;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

REFERENCES:

1. Murlidhar P, Byadgi PS. Charaka - The great legendary and visionary of Ayurveda. Int J Res Ayurveda Pharm. 2011; 2 (4): 1011-1015.
2. Goswami PK. Comparative studies of Bhanumati and Nibandha samgraha with special reference to Arishta vignana (prognostic science). AYU 2011; 32: 147-153. Available from: http://www.ayujournal.org/text.asp?2011/32/2/147/92540
3. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 11th chapter: Anu jyoteeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 369-371.
4. Duong S, Patel T, Chang F. Dementia: What pharmacists need to know. Can Pharm J (Ott). 2017; 150 (2): 118-129. doi: 10.1177/1715163517690745. PMID: 28405256; PMCID: PMC5384525.
5. Harris D. Delirium in advanced disease. Postgrad Med J. 2007; 83 (982): 525-528. doi: 10.1136/pgmj.2006.052431. PMID: 17675545; PMCID: PMC2600115.
6. McDonald WM. Overview of Neurocognitive Disorders. Focus (Am Psychiatr Publ). 2017; 15 (1): 4-12. doi: 10.1176/appi.focus.20160030. PMID: 31975834; PMCID: PMC6519631.
7. Sutin AR, Stephan Y, Luchetti M, Terracciano A. Self-reported personality traits are prospectively associated with proxy-reported behavioral and psychological symptoms of dementia at the end of life. Int J Geriatr Psychiatry. 2018; 33 (3): 489-494. doi: 10.1002/gps.4782. PMID: 28869657; PMCID: PMC5807122.
8. Mitchell SL, Teno JM, Kiely DK, Shaffer ML, Jones RN, Prigerson HG, Volicer L, Givens JL, Hamel MB. The clinical course of advanced dementia. N Engl J Med. 2009; 361 (16): 1529-1538. doi: 10.1056/NEJMoa0902234. PMID: 19828530; PMCID: PMC2778850.
9. von Arx T, Tamura K, Yukiya O, Lozanoff S. The Face–A Vascular Perspective. A literature review. Swiss dental journal. 2018; 128 (5): 382. Available from: https://www.swissdentaljournal.org/fileadmin/upload_sso/2_Zahnaerzte/2_SDJ/SDJ_2018/SDJ_5_2018/SDJ_2018-05_research.pdf
10. Han HC. Twisted blood vessels: symptoms, etiology and biomechanical mechanisms. J Vasc Res. 2012; 49 (3): 185-197. doi: 10.1159/000335123. PMID: 22433458; PMCID: PMC3369246.
11. Nicholls SC. Sequelae of untreated venous insufficiency. Semin Intervent Radiol. 2005; 22 (3): 162-168. doi: 10.1055/s-2005-921960. PMID: 21326689; PMCID: PMC3036289.
12. Ashizawa T, Xia G. Ataxia. Continuum (Minneap Minn). 2016; 22 (4 Movement Disorders): 1208-1226. doi: 10.1212/CON.0000000000000362. PMID: 27495205; PMCID: PMC5567218.
13. Shrimanker I, Tadi P, Sánchez-Manso JC. Parkinsonism. [Updated 2019 Jun 4]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK542224/
14. Khan MS, Mohammad SH, Deepa F, Tahir F. Association between Pus Cells and Semen Parameters in Infertile Pakistani Males. Sultan Qaboos Univ Med J. 2012; 12 (4): 479-484. doi: 10.12816/0003174. PMID: 23275845; PMCID: PMC3523998.
15. Mathers MJ, Degener S, Sperling H, Roth S. Hematospermia - A symptom with many possible causes. Dtsch Arztebl Int. 2017; 114 (11): 186-191. doi: 10.3238/arztebl.2017.0186. PMID: 28382905; PMCID: PMC5387851.
16. Elliot AH. The Specific Gravity of the Urine. Cal West Med. 1931; 34 (3): 197. PMID: 18741697; PMCID: PMC1657706.
17. Cathy F. What is urine specific gravity? Nursing 2008; 38 (7): 14. doi: 10.1097/01.NURSE.0000325315.41513.a0
18. Kasırga E. The importance of stool tests in diagnosis and follow-up of gastrointestinal disorders in children. Turk Pediatri Ars. 2019; 54 (3): 141-148. doi: 10.14744/TurkPediatriArs.2018.00483. PMID: 31619925; PMCID: PMC6776453.
19. Wickham RJ. Assessment of Constipation in Patients with Cancer. J Adv Pract Oncol. 2016; 7 (4): 457-462. PMID: 29226003; PMCID: PMC5679034.
20. McDonald CM. Clinical approach to the diagnostic evaluation of hereditary and acquired neuromuscular diseases. Phys Med Rehabil Clin N Am. 2012; 23 (3): 495-563. doi: 10.1016/j.pmr.2012.06.011. PMID: 22938875; PMCID: PMC3482409.
21. InformedHealth.org [Internet]. Cologne, Germany: Institute for Quality and Efficiency in Health Care (IQWiG); 2006. Causes and signs of edema. 2008 Nov 5 [Updated 2016 Dec 30]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK279409/
22. Kaplan AP. Angioedema. World Allergy Organ J. 2008; 1 (6): 103-113. doi: 10.1097/WOX.0b013e31817aecbe. PMID: 23282406; PMCID: PMC3651192.
23. Wang HC, Yousef E. Erythropoietic protoporphyria masquerading as angioedema in a 4-year-old female. Allergy Asthma Clin Immunol. 2006; 2 (1): 20-23. doi: 10.1186/1710-1492-2-1-20. PMID: 20529216; PMCID: PMC3231647.
24. Michael Y, Shaukat NM. Erysipelas. [Updated 2019 Dec 20]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK532247/
25. Miconi F, Cassiani L, Savarese E, Celi F, Papini M, Principi N, Esposito S. Targetoid Skin Lesions in a Child: Acute Hemorrhagic Oedema of Infancy and Its Differential Diagnosis. Int J Environ Res Public Health. 2019; 16 (5): 823. doi: 10.3390/ijerph16050823. PMID: 30845781; PMCID: PMC6427215.
26. Kang JH. Febrile Illness with Skin Rashes. Infect Chemother. 2015; 47 (3): 155-166. doi: 10.3947/ic.2015.47.3.155. PMID: 26483989; PMCID: PMC4607768.
27. Adya KA, Inamadar AC, Palit A. Reticulate dermatoses. Indian J Dermatol. 2014; 59 (1): 3-14. doi: 10.4103/0019-5154.123480. PMID: 24470653; PMCID: PMC3884924.
28. Baughn RE, Musher DM. Secondary syphilitic lesions. Clin Microbiol Rev. 2005; 18 (1): 205-216. doi: 10.1128/CMR.18.1.205-216.2005. PMID: 15653827; PMCID: PMC544174.
29. Cerroni L. Lymphoproliferative lesions of the skin. J Clin Pathol. 2006; 59 (8): 813-826. doi: 10.1136/jcp.2005.033019. PMID: 16873563; PMCID: PMC1860435.
30. Subbanna PK, Singh NV, Swaminathan RP. Cutaneous polyarteritis nodosa: A rare isolated cutaneous vasculitis. Indian Dermatol Online J. 2012; 3 (1): 21-4. doi: 10.4103/2229-5178.93488. PMID: 23130255; PMCID: PMC3481924.
31. Thomas AE, Anderson J. Purpuric and petechial rashes in adults and children: Initial assessment. BMJ 2016; 352: i1285. doi: https://doi.org/10.1136/bmj.i1285
32. Chandrashekar P, Sathiasekar AC, Namaratha K, Singarayan JL, Gnanam AP. A rare case of mumps orchitis. J Pharm Bioallied Sci. 2015; 7 (Suppl 2): S773-775. doi: 10.4103/0975-7406.163555. PMID: 26538966; PMCID: PMC4606708.
33. Freeman AM, Matto P. Adenopathy. [Updated 2019 Nov 27]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK513250/
34. Saccucci M, Di Carlo G, Bossù M, Giovarruscio F, Salucci A, Polimeni A. Autoimmune diseases and their manifestations on oral cavity: diagnosis and clinical management. J Immunol Res. 2018; 2018. Available from: https://doi.org/10.1155/2018/6061825
35. Fugl A, Andersen CL. Epstein-Barr virus and its association with disease - a review of relevance to general practice. BMC Fam Pract. 2019; 20 (1): 62. doi: 10.1186/s12875-019-0954-3. PMID: 31088382; PMCID: PMC6518816.

36. Sampson EL, West E, Fischer T. Pain and delirium: mechanisms, assessment, and management. Eur Geriatr Med 2020; 11: 45–52. https://doi.org/10.1007/s41999-019-00281-2
37. Martins S, Fernandes L. Delirium in elderly people: a review. Front Neurol. 2012; 3: 101. doi: 10.3389/fneur.2012.00101. PMID: 22723791; PMCID: PMC3377955.
38. De Sousa A, Mehta J. Trichotillomania in a case of vascular dementia. Int J Trichology. 2013; 5 (1): 38-39. doi: 10.4103/0974-7753.114715. PMID: 23960397; PMCID: PMC3746227.
39. Caixeta L, Lopes DB. Trichotillomania in a dementia case. Dement Neuropsychol. 2011; 5 (1): 58-60. doi: 10.1590/S1980-57642011DN05010011. PMID: 29213722; PMCID: PMC5619141.
40. Baquero M, Martín N. Depressive symptoms in neurodegenerative diseases. World J Clin Cases. 2015; 3 (8): 682-693. doi: 10.12998/wjcc.v3.i8.682. PMID: 26301229; PMCID: PMC4539408.
41. Harris D. Delirium in advanced disease. Postgrad Med J. 2007; 83 (982): 525-528. doi: 10.1136/pgmj.2006.052431. PMID: 17675545; PMCID: PMC2600115.
42. Arzy S, Overney LS, Landis T, Blanke O. Neural mechanisms of embodiment: Asomatognosia due to premotor cortex damage. Arch Neurol. 2006; 63 (7): 1022–1025. doi:10.1001/archneur.63.7.1022
43. van Stralen HE, van Zandvoort MJ, Dijkerman HC. The role of self-touch in somatosensory and body representation disorders after stroke. Philos Trans R Soc Lond B Biol Sci. 2011; 366 (1581): 3142-3152. doi: 10.1098/rstb.2011.0163. PMID: 21969696; PMCID: PMC3172603.
44. Rowe FJ, Wright D, Brand D, Jackson C, Harrison S, Maan T, Scott C, Vogwell L, Peel S, Akerman N, Dodridge C, Howard C, Shipman T, Sperring U, Macdiarmid S, Freeman C. Profile of Gaze Dysfunction following Cerebrovascular Accident. ISRN Ophthalmol. 2013; 2013: 264604. doi: 10.1155/2013/264604. PMID: 24558601; PMCID: PMC3914228.
45. M Das J, Naqvi IA. Anton Syndrome. [Updated 2019 Dec 3]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK538155/
46. Han JH, Wilber ST. Altered mental status in older patients in the emergency department. Clin Geriatr Med. 2013; 29 (1): 101-136. doi: 10.1016/j.cger.2012.09.005. PMID: 23177603; PMCID: PMC3614410.
47. Bonanno FG. Clinical pathology of the shock syndromes. J Emerg Trauma Shock. 2011; 4 (2): 233-243. doi: 10.4103/0974-2700.82211. PMID: 21769211; PMCID: PMC3132364.
48. Kumar A, Wroten M. Agnosia. [Updated 2019 Sep 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK493156/
49. Cavazzana A, Röhrborn A, Garthus-Niegel S, Larsson M, Hummel T, Croy I. Sensory-specific impairment among older people. An investigation using both sensory thresholds and subjective measures across the five senses. PLoS One. 2018; 13 (8): e0202969. doi: 10.1371/journal.pone.0202969. PMID: 30148857; PMCID: PMC6110574.
50. Hirakawa Y, Uemura K. Signs and Symptoms of Impending Death in End-of-life Elderly Dementia Sufferers: Point of View of Formal Caregivers in Rural Areas: A Qualitative Study. J Rural Med. 2012; 7 (2): 59-64. doi: 10.2185/jrm.7.59. PMID: 25649740; PMCID: PMC4309317.
51. Waters F, Fernyhough C. Hallucinations: A Systematic Review of Points of Similarity and Difference Across Diagnostic Classes. Schizophr Bull. 2017; 43 (1): 32-43. doi: 10.1093/schbul/sbw132. PMID: 27872259; PMCID: PMC5216859.
52. Mitchell SL. Advanced Dementia. N Engl J Med. 2015; 373 (13): 1276-1277. doi: 10.1056/NEJMc1509349. PMID: 26398084; PMCID: PMC4685690.
53. Bush SH, Tierney S, Lawlor PG. Clinical Assessment and Management of Delirium in the Palliative Care Setting. Drugs. 2017; 77 (15): 1623-1643. doi: 10.1007/s40265-017-0804-3. PMID: 28864877; PMCID: PMC5613058.
54. Houston RE. The Angry Dying Patient. Prim Care Companion J Clin Psychiatry. 1999; 1 (1): 5-8. doi: 10.4088/pcc.v01n0102. PMID: 15014699; PMCID: PMC181044.
55. Lee DH. Approach to end of life care. Ochsner J. 2002; 4 (2): 98-103. PMID: 22822325; PMCID: PMC3399266.
56. Caddell A, Hazelton L. Accepting gifts from patients. Can Fam Physician. 2013; 59 (12): 1259-1260, e523-5. PMID: 24336530; PMCID: PMC3860914.
57. Rector T, Taylor B, Sultan S, et al. Life Expectancy Calculators [Internet]. Washington (DC): Department of Veterans Affairs (US); 2016. Available from: https://www.ncbi.nlm.nih.gov/books/NBK424560/
58. Hui D, Dos Santos R, Chisholm G, Bansal S, Souza Crovador C, Bruera E. Bedside clinical signs associated with impending death in patients with advanced cancer: preliminary findings of a prospective, longitudinal cohort study. Cancer. 2015; 121 (6): 960-967. doi: 10.1002/cncr.29048. PMID: 25676895; PMCID: PMC4352117.

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GOMAYA CHOORNEEYAM OF CHARAKA INDRIYA STHANA -AN EXPLORATIVE STUDY

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REVIEW ARTICLE

GOMAYA CHOORNEEYAM OF *CHARAKA INDRIYA STHANA- AN EXPLORATIVE STUDY*

Abstract:
'Charaka samhita' is the oldest available literature of *Ayurveda* (estimated to be documented in 200 BC) and it is truly a versatile classic. *'Indriya sthana'* (one among the eight sections of '*Charaka samhita'*, which deals with prognostic aspects) consist the description of '*Arishta lakshanas'* (fatal signs and symptoms which denotes imminent death) which definitely occurs in a diseased person before death. '*Indriya sthana*' consists 12 chapters and '*Gomaya choorneeyam indriyam*' is the last chapter of '*Charaka Indriya Sthana*'. The present work is aimed to explore the contents of the '*Gomaya choorneeyam indriyam*' chapter and also to analyze their rationality & prognostic significance in present era. This chapter deals with various '*Arishta lakshanas*' related to auspicious or inauspicious features related to '*Doota'* (care giver or messenger or informer), good & bad omens (occurs on the way to the patients house or at patients house) and their effect on prognosis, medical ethics and brief summary of the whole '*Indriya sthana*'. Most of its content is related to '*Jyotishya* or *Nimitta* or *Shakuna shastra'* (subject which deals with astrology and fortunes). Description of opportunistic infections such as 'Malassezia' in immunocompromised patients, Parkinson's disease, Dementia, Cachexia, Delirium, and concepts like 'Infrared thermography' or 'infrared imaging' or 'thermal imaging' are quoted in this chapter. '*Dootadhikara'* section consist the description of caregiver's role, positive and negative attributes and their influence on prognosis, caregiver role strain or burden, and complexities between caregiver, care recipient (patient) and physician. Basic foundations related to various concepts like 'Positive or health psychology' and 'Psychoneuroimmunology' etc can be seen in this chapter. Further research works are required to substantiate the clinical findings quoted in this chapter.

Key Words: Caregiver, Dementia, Delirium, Parkinson's disease, Positive psychology, Psychoneuroimmunology

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INTRODUCTION:

'Charaka samhita' is the most authoritative and comprehensive compendium of *Ayurvedic* knowledge covering wide variety of aspects related to health care. It is the oldest available literature of *Ayurveda* (estimated to be documented in 200 BC) and it is truly a versatile classic. '*Charaka samhita*' consists of 9295 verses which are divided among 8 sections. [1] *'Indriya sthana'* (one among the eight sections of '*Charaka samhita'*, which deals with prognostic aspects) aimed at estimating '*Ayu'* (life span) with the help of '*Arishta lakshanas'* (fatal signs and symptoms which denotes imminent death). '*Arishta lakshanas'* are the fatal signs of death which definitely occurs in diseased person before death. '*Indriya sthana'* is dedicated for the identification of '*Arishta lakshanas'* and estimation of prognosis. [2]

'*Indriya sthana*' consists 12 chapters and '*Gomaya choorneeyam indriyam*' is the last chapter of '*Charaka Indriya Sthana*'. This chapter deals with various '*Arishta lakshanas*' related to auspicious or inauspicious features related to '*Doota'* (care giver or messenger or informer), good & bad omens (occurs on the way to the patients house or at patients house) and their effect on prognosis, medical ethics and brief summary of the whole '*Indriya sthana*'. This is the biggest chapter among all the 12 chapters of *Indriya sthana*. Most of its content is related to '*Jyotishya* or *Nimitta* or *Shakuna shastra'* (subject which deals with astrology and fortunes). [3] The relevant terms which represent the conditions explained in '*Indriya sthana*' are 'Actively dying', 'end of life', 'terminally ill', 'terminal care', and 'transition of care' etc for which palliative care or hospice care is required. The present work is aimed to explore the contents of the *'Gomaya choorneeyam indriyam*' chapter and also to analyze their rationality & prognostic significance in present era.

MAIN CONTENTS (Table 1, 2 & 3):

यस्य गोमयचूर्णाभं चूर्णं मूर्धनि जायते। सस्नेहं भ्रस्यते चैव मासांतं तस्य जीवितम्॥
Yasya --- jeevitam [*Verse* 3] [3]

Seborrheic dermatitis (SD) is a chronic inflammatory skin disorder characterized in immunocompetent adult patients (मासांतं तस्य जीवितम्) by periods of exacerbation and remission. In patients with AIDS (acquired immunodeficiency syndrome), the incidence of SD increases markedly (मासांतं तस्य जीवितम्). Adult SD presents most often on the face and/or scalp (मूर्धनि). Dandruff (pityriasis sicca) is defined as fine scalp scaling without the visible presence of inflammation and considered as part of the spectrum of adult SD. The scalp scaling associated with SD and dandruff is bothersome as flakes (गोमयचूर्णाभम् चूर्णम्), which are shed from the scalp. SD is associated with the increase in cutaneous lipids resulting from androgen-driven sebaceous gland

development and sebum secretion (सस्नेहम्). [4] SD is caused by over proliferation of the lipophilic (सस्नेहम्) fungus *Malassezia*. PD (Parkinson's disease) and SD are strongly associated. *Malassezia* can also be seen in internal organs, including the CNS which raises the possibility that *Malassezia* might be directly contributing to PD. AIDS is causally associated with both Parkinsonism and SD, suggesting that weak T cell-mediated control (मासांतं तस्य जीवितम्) of commensal microbes such as *Malassezia* might contribute to both. [5] The much higher percentage of positive cultures of Malassezia species in immunocompromised patients confirms that impaired cellular immunity may facilitate fungal survival on the skin. [6] SD is found in increased sebaceous gland activity (सस्नेहम्), immunodeficiency (lymphoma and HIV-AIDS etc), neurological and psychiatric conditions (PD, stroke, Alzheimer's dementia, autonomic dysfunction and major depression), and low ambient temperatures etc conditions (मासांतं तस्य जीवितम्). [7] The above verse indicates SD in an immunocompromised patient which might indicate impending death.

निकषन्निव यः पादौ च्युतांसः परिधावति। विकृत्या न स लोकेऽस्मिंश्चिरं वसति मानवः॥

Nikashanniva --- maanava [*Verse* 4] [3]

निकषन्निव घर्षन्निव।

Nikashanniva gharshanniva [*Chakrapani*, *Verse* 4] [3]

Parkinson's disease (PD) also called as a "shaking palsy" is a chronic, progressive, neurodegenerative disease characterized by tremor, rigidity, and bradykinesia. Gait abnormalities such as difficulty getting started or initiating movements, a slow and shuffling gait, hastening of the gait (in which their walking speed increases with small, rapid steps in an effort to "catch up" with their displaced center of gravity) (परिधावति), immobility (when confronted by the need to turn or enter through a narrow door) and freezing (निकषन्निव यः पादौ). Rigidity in PD presents as increased muscle tone or amplified resistance (निकषन्निव घर्षन्निव) to a passive range of motion (cogwheel rigidity). Postural instability in PD can be seriously disabling because of its association with the loss of balance and the risk of falls. Mortality is often associated with complications related to immobility, such as pneumonia, pulmonary embolism, and falls (न स लोकेऽस्मिंश्चिरं वसति). [8] A stooped posture may develop in PD patient's where the head is bowed and the shoulders are drooped (च्युतांसः). Patients may halt in mid-stride and "freeze" in place, possibly even toppling over, or they may walk with a series of quick (परिधावति), small steps as if hurrying forward to keep balance (festination) (निकषन्निव यः पादौ). [9]

यस्य स्नातानुलिप्तस्य पूर्वं शुष्यत्युरो भृशम्। आद्रेषु सर्वगात्रेषु सोऽर्धमासं न जीवति॥

Yasya --- jeevati [*Verse* 5] [3]

According to the above verse, 'if a person observes that after taking bath or after applying herbal paste, his chest indicates impending death within 15 days'. Chest dry off earlier compared to other body parts indicate the higher temperature in chest. Infrared thermography or infrared imaging or thermal imaging is a non-contact tool, which maps the surface temperature of a body. Thermal images have been used to quantify sensitive changes in skin temperature in relation to certain diseases. Infrared thermography has the advantages of being noninvasive, fast, reliable, with non-contact, capable of producing multiple recordings at short time intervals, and absolutely safe for patients and doctors. Infrared imaging is used to measure subtle physiological changes by various conditions, e.g., contusions, fractures, burns, carcinomas (सोऽर्धमासं न जीवति), lymphomas, melanomas, prostate cancer (सोऽर्धमासं न जीवति), dermatological diseases, rheumatoid arthritis, diabetes mellitus and associated pathology, deep venous thrombosis (DVT), liver disease, bacterial infections, etc. These conditions are commonly associated with regional vasodilation, hyperthermia (पूर्वं शुष्यत्युरो), hyperperfusion, hypermetabolism, and hypervascularization which generate a higher-temperature heat source (पूर्वं शुष्यत्युरो). [10]

यमुद्दिश्यातुरं वैद्यः संवर्तयितुमौषधम्। यतमानो न शक्नोति दुर्लभं तस्य जीवितम्॥
विज्ञातं बहुशः सिध्दं विधिवच्चावचारितम्। न सिध्यत्यौषधं यस्य नास्ति तस्य चिकित्सितम्॥
आहारमुपयुञ्जानो भिषजा सूपकल्पितम्। यः फलं तस्य नाप्नोति दुर्लभं तस्य जीवितम्॥

Yamuddishya --- jeevitam [*Verse* 6-8] [3]

The above verses indicate a common theme, 'a patient who doesn't responds or get improvements in his disease condition to a standard, potent and efficacious medicine or therapy or diet provided by the physician, indicates impending death'. The above verses indicate irreversible pathologies, multi organ failure, terminal illness and cachexia etc conditions commonly occur at the end stages of life. Withdrawal of treatment and palliation of symptoms is more appropriate for patients who don't respond to initial treatment (न सिध्यत्यौषधम्) and who remain comatose. Early communication with the next of kin, family or advocate is always necessary. When the prognosis is poor (दुर्लभं तस्य जीवितम्) these discussions will include ceiling of care, consideration of future withdrawal of treatment and cardiopulmonary resuscitation. [11] End of life (EOL) care is defined as care that helps those with advanced, progressive, incurable, and serious illness to live as well as possible until they die. Hospice care is a type of palliative care program for people in the final months of life and is considered when the person's condition deteriorates

and active treatment (विज्ञातं बहुशः सिध्दं विधिवच्चावचारितम्) does not control disease (न सिध्यत्यौषधम्). Since progressive deterioration and death is anticipated (नास्ति तस्य चिकित्सितम्), the emphasis of care moves from active treatment of disease to treatment to give comfort and control symptoms. [12]

Cachexia which can't be reversed with protein and/or caloric intake (आहारमुपयुञ्जानो सूपकल्पितम्) is usually associated with poor prognosis (दुर्लभं तस्य जीवितम्). CIC (cancer induced cachexia) cannot be reversed (फलं तस्य नाप्नोति) by feeding alone. There is no accepted therapy for CIC which has been leading to a feeling of helplessness by both the patient and physician as weight continues to drop. Therapeutic options for CIC are limited (फलं तस्य नाप्नोति). It is important to understand that significant increases in caloric intake, and use of enteral nutrition (आहारमुपयुञ्जानो भिषजा सूपकल्पितम्) and parenteral nutrition, are not always beneficial (फलं तस्य नाप्नोति) in CIC patients. [13] The signs explained in the above verses also denote inauspiciousness or acts as bad omens.

दूताधिकार (*Dootadhikara*):

मुक्तकेशेऽथवा नग्ने रुदत्यप्रयेऽथवा। भिषगभ्यगतं दृष्ट्वा दूतं मरणमादिशेत्॥

Mukta kesho --- marana maadishet [*Verse* 10] [3]

अप्रयते इति अपवित्रे।

Aprayate iti apavitre [*Chakrapani, Verse* 10] [3]

सुप्ते भिषजि ये दूतश्छिन्दत्यपि च भिन्दति। आगच्छन्ति भिषक् तेषां न भ र्तारमनुव्रजेत्॥

जुह्वत्यग्निं तथा पिण्डान् पितृभ्यो निर्वपत्यपि। वैद्ये दूता य आयान्ति ते घ्नन्ति प्रजिघांसवः॥

कथयत्यप्रशस्तानि चिन्तयत्यथवा पुनः। वैद्ये दूता मनुष्याणामागच्छन्ति मुमूर्षताम्॥

मृतदग्धविनष्टानि भजति व्याहरत्यपि। अप्रशस्तानि चान्यानि वैद्ये दूता मुमूर्षताम्॥

Supte --- mumurshataam [*Verse* 11-14] [3]

'*Doota'* (messenger / caregiver / family member) is a person who conveys the information regarding clinical condition of the patient to physician during ancient times or *samhita* period. Anyone can play the role of '*doota'* e.g., patient's family member or relative or friend or care giver or servant or nurse etc (दूताश्च यद्यपि रोगिहितमिच्छन्ति). The above verses contain the description of some attributes of *doota* which indicates the prognosis of the patient's condition. It is interesting to know that various signs pertaining to *doota* or messenger like, dressing, behaviour, time of arrival at physician's house, mental state, and the circumstances etc play a significant role in determining the prognosis of a patient's clinical condition. If *doota* arrives at physician's house during those times when the physician had ragged or uncombed hair, when nude or weeping or unhygienic or sleeping or having lunch or cutting or splitting something or while doing prayer or offerings or while having negative thoughts and while speaking negative words like death or loss or damage etc indicates inauspiciousness, bad prognosis of the patient's clinical condition and also impending death. These signs could be understood with the help of '*Jyotishya shastra*' or '*Nimitta shastra*'.

विकारसामान्यगुणे देशे कालेऽथवा भिषक्। दूतमभ्यागतं दृष्ट्वा नातुरं तमुपाचरेत्॥

Vikaara --- tamupaacharet [*Verse* 15] [3]

If the patient is having such a disease (based on the description provided by *doota*) which is endemic, seasonal and prevalent in that particular area where patient lives, indicates bad prognosis. The above verse denotes that the patient might have been suffering with a disease which is prevalent and endemic in that particular are and very difficult to treat. Seasonal infections of humans range from childhood diseases, such as measles, diphtheria and chickenpox, to faecal–oral infections, such as cholera and rotavirus, vector-borne diseases including malaria and even sexually transmitted gonorrhoea. [14] Infectious diseases have been a significant threat throughout the world. In the twenty-first century, we continue to fight both old pathogens like the plague, and new pathogens like human immunodeficiency virus (HIV). Some infectious diseases like tuberculosis (TB) and malaria are endemic to many areas, imposing substantial but steady burdens. Others like influenza fluctuate in pervasiveness and intensity, wreaking havoc in the developing and developed worlds. [15] The above verse denotes that endemic, seasonal, and contagious or infectious diseases are difficult to treat and associated with higher rates of mortality.

दीनभीतद्रुतत्रस्तमलिनामसतीं स्त्रियम्। त्रीन् व्याकृतींश्च षण्डांश्च दूतान् विद्यान्मुमूर्षताम्॥

Deena --- mumurshataam [*Verse* 16] [3]

षण्डा नपुंसकाः। अङ्गव्यसनी छिन्ननासादिः। उग्रकर्मा मारणाद्यकार्यप्रवृत्तः।

Shandaa --- pravrutta [*Chakrapani, Verse* 16] [3]

अङ्गव्यसनिनं दूतं लिङ्गिनं व्याधितं तथा। संप्रेक्ष्य चोग्रकर्माणं न वैद्यो गन्तुमर्हति॥

आतुरार्थमनुप्राप्तं खरोष्ट्ररथवाहनम्। दूतं दृष्ट्वा भिषग्विद्यादातुरस्य पराभवम्॥

पलालवुसमांसास्थिकेशलोमनखद्विजान्। मार्जनीं मुसलं शूर्पमुपानच्चर्मविच्युतम्॥

तृणकाष्ठतुषाङ्गारं स्पृशन्तो लोष्टमश्म च। तत्पूर्वदर्शने दूता व्याहरन्ति मुमूर्षताम्॥

यस्मिंश्च दूते ब्रुवति वाक्यमातुरसंश्रयम्। पश्येन्निमित्तमशुभं तं च नानुव्रजेद्भिषक्॥

तथा व्यसनिनं प्रेतं प्रेतालङ्कारमेव वा। भिन्नं दग्धं विनष्टं वा तद्वादीनि वचांसि वा॥

रसो वा कटुकस्तीव्रो गन्धो वा कौणपो महान्। स्पर्शो वा विपुलः क्रूरो यद्वाऽन्यदशुभं भवेत्॥

तत्पूर्वमभितो वाक्यं वाक्यकालेऽथवा पुनः। दूतानां व्याहृतं श्रुत्वा धीरो मरणमादिशेत्॥

Avyanga --- marana maadishet [*Verse* 17-24] [3]

Doota having attributes like depression, afraid of, agitation, tiredness, unhygienic, evil-mind, lady, if three people (messengers) comes together, physically disability, handicapped, eunuch, sociopath and having disease etc, comes to physician's house to narrate the clinical condition of the patient, then physician should avoid to go along with *doota* having above said

attributes as they denote impending death of the patient and also bad prognosis. If *doota* arrives in a vehicle (cart drawn by mules or camel etc) at physician's house denote inauspiciousness and impending death of the concerned patient. If physician finds out that *doota* has touched various inauspicious objects like dust, husk, flesh, bones, hair, teeth, nails, broom stick, pestle or mace, grain sieve, shoes, skin or leather, grass, timber or wood, coal, clod and pebbles or stones etc indicates impending death of the concerned patient hence physician should avoid his visit. While listening the history of the patient narrated by *doota*, if physician finds out any other inauspicious things then he should avoid his visit. While having a conversation with *doota*, if physician notices or observes or finds out or feels any other inauspicious things (such as intoxicated persons, person with ghostly appearance, broken or burnt or destroyed objects or words, abusive words, unpleasant smells, uncomfortable touch or sensations and any other such type of inappropriate objects or feelings or persons), then he should avoid his visit. All the above verses pertaining to '*dootadhikara'*, denotes inauspiciousness, impending death and poor prognosis of concerned patient hence physician should avoid to visit such type of patient's house.

प्रशस्त दूता लक्षणानि (Positive attributes of caregiver):

स्वाचारं हृष्टमव्यङ्गं यशस्यं शुक्लवाससम्। अमुण्डमजटं दूतं जातिवेशक्रियासमम्॥
अनुष्ट्रखरयानस्थमसन्ध्यास्वग्रहेषु च। अदारुणेषु नक्षत्रेष्वनुग्रेषु ध्रुवेषु च॥
विना चतुर्थीं नवमीं विना रिक्तां चतुर्दशीम्। मध्याह्नमर्धरात्रं च भूकम्पं राहुदर्शनम्॥
विना देशमशस्तं चाशस्तौत्पातिकलक्षणम्। दूतं प्रशस्तमव्यग्रं निर्दिशेदगतं भिषक्॥

Prashasta --- bhishak [*Verse* 67-70] [3]

Caregiver who is possessed with following positive attributes like having good conduct or behaviour, hygienic, well dressed, having well combed hair and personal hygiene, plans his visit with physician at auspicious times or days only, not agitated or not suffering with anxiety, and coming from a reputed caste or country or place or family etc are considered as auspicious and denotes good prognosis.

Caregiver / *Doota*:

Caregiver is an individual helps with physical and psychological care for a person in need. [16] Caregivers can be professional (such as physicians and nurses) or informal (typically family members or friends) who provide care to individuals with a variety of conditions including advanced age, dementia, and cancer. [17] As is the case for most caregivers, they are often family members, and usually they are unpaid. Caregivers can be called upon to provide a wide variety of assistance with activities of daily living, including bathing, dressing, toileting, transferring, eating, cooking, medications and managing the home. [16] As caregivers are often faced with multiple concurrent stressful events and extended, unrelenting stress, they may experience negative health effects. [17] Caregiver burden can be defined as "a multidimensional response to physical, psychological, emotional, social and financial stressors associated with the caregiving experience". [16] Signs and symptoms of caregiving stress are often psychological problems such as anxiety (भीत / द्रुत), depression (दीन), worry (भीत), loneliness, higher levels of emotional distress, fatigue (त्रस्त), sleep impairment and unhealthy behaviours etc. [17] Very high rates of depression (दीन) have been observed in caregivers. Behavioural disturbances (particularly anger or aggressive behaviour) (उग्रकर्मा) and decreased patient ADL (activities of daily living) function both were independently associated with caregiver depression. [18] Caregiving has an important influence on the prognosis of dementia, particularly regarding the management strategy implemented. Strategies to manage diseases like dementia are depends or based upon the characteristics of caregivers. [19]

Personal qualities if caregivers such as kindness (स्वाचारम्), understanding (जातिवेशक्रियासमम्), and courage are known to improve patients hope, strength and known have healing powers for patients. Patients become more self-confident and dare to trust their caregivers with positive attributes. Caregivers' care generates calmness, confidence, gratitude, and physical closeness. The caregiver provides support, guidance, time for communication and information. Based on previous works, positive caregivers attributes (दूतं प्रशस्तम्) are contained in five categories and subcategories like, 'being human' (being charitable and showing humanity) (स्वाचारम्), 'care through physical contact', 'care by nurturing communication (communication with words and body language), 'joy and laughter in care' (pleasure, satisfaction, joy and happiness) (हृष्टम्), and 'a sense of mutuality' (common interests and shared happiness, ensuring patient's needs) (जातिवेशक्रियासमम्). Both caregivers and patients believed that attributes such as tranquillity, empathy, courage, and warmth are important personal qualities used when caring. Patients believe that humility, commitment (अव्यग्रम्), kindness, sensitivity, and so forth are important personal qualities caregiver (स्वाचारम्, हृष्टम्, यशस्यम्, जातिवेशक्रियासमम्, अव्यग्रम्, and दूतं प्रशस्तम्) should possess. [20]

Various attributes like 'दीन, भीत, द्रुत, and त्रस्त' etc denotes caregiver burden (caregiver may suffer with depression, anxiety, aggressive behaviours and fatigue due to severe stress caused by the patient's chronic debilitating condition). Caregiver who is 'unhygienic' or 'suffering with a disease' (व्याधितम् & मलिनम्) may become source of secondary infection or spread infection to the immunocompromised patient (to whom he is providing care). Physically handicapped or disabled caregiver (छिन्ननासादिः) may not provide quality

care giving services to the patient. Caregiver arriving at physician's house by carts drawn by mules or camels (खरोष्ट्ररथवाहनम्) denotes 'poor financial condition' or 'lack of resources' at patient's house which may affect the compliance to treatment and prognosis. Caregiver suffering with psychiatric diseases or severe emotional stress may show attributes like 'व्यसनिनं and प्रेतं प्रेतालङ्कारमेव वा' etc (which indicates he might not take proper care of the patient) and denotes poor prognosis. The verses pertaining to '*Dhootadhikara'* not only denote 'bad omens' or 'inauspiciousness' but also complexities of caregiving, caregiver burden and attributes of caregiver etc. Appearance, attributes, behaviour, and other associated features of caregiver, mirrors the actual condition of the patient (to whom he is providing care); hence physician can assess the condition of the patient by assessing or carefully analysing caregiver's behaviour or attributes as mentioned in the above verses and estimate the prognosis.

Various auspicious and inauspicious signs:

1. पथ्यातुरकुलानां औत्पातिकानि (Prognosis based on inauspicious omens occurring on the way to patient's house):

अवश्रुतमथोत्क्रुष्टं स्खलनं पतनं तथा। आक्रोशः संप्रहारो वा प्रतिषेधो विगर्हणम्॥
वस्त्रोष्णीषोत्तरासङ्गश्छत्रोपानद्युगाश्रयम्। व्यसनं दर्शनं चापि मृतव्यसनिनां तथा॥
चैत्यध्वजपताकानां पूर्णानां पतनानि च। हतानिष्टप्रवादाश्च दूषणं भस्मपांशुभिः॥
पथच्छेदो बिडालेन शुना सर्पेण वा पुनः। मृगद्विजानां क्रूराणां गिरो दीप्तां दिशं प्रति॥
शयनासनयानानामुत्तानानां च दर्शनम्। इत्येतान्यप्रशस्तानि सर्वाण्याहुर्मनीषिणः॥
एतानि पथि वैद्येन पश्यताऽऽतुरवेश्मनि। श्रुण्वता च न गन्तव्यं तदागारं विपश्चिता॥

Avakshuta --- vipashchita [*Verse* 25-31] [3]

The above verses contain the description of various inauspicious signs (indicating imminent death of a patient) observed by the physician on the way to patient's house. If physician sees someone who is sneezing, falling down, got an accident, trauma, crying, beating, shouting, getting obstructed on the way or diverted towards long route etc inauspicious things indicates poor prognosis of the patient's condition. Physician garments getting torn by thorns or his shoes becoming entangled by nails or breakdown of his umbrella, confronting dead person or quarrelling people or fallen tree or flag or breaking down of pot or water container or receiving death new of dearer ones or any other inauspicious things on the way if physician finds out indicates imminent death of the concerned patient. If physicians cloths getting dirty or covered by dust or ash, cat or snake or dog crossing the path, scariest sounds of animals and flipping over of vehicles after road collision or accident etc are considered as bad omens which may appear on the way to patient's house and denotes inauspiciousness as well as imminent death of concerned patient.

2. पथ्यातुरकुलानां प्रशस्तदर्शनानि (Auspicious signs seen on the way to patient's house):

दध्यक्षतद्विजातीनां वृषभाणां नृपस्य च। रत्नानां पूर्णकुम्भानां सितस्य तुरगस्य च॥
सुरध्वजपताकानां फलानां यावकस्य च। कन्यापुंवर्धमानानां बध्दस्यैकपशोस्तस्था॥
पृथिव्या उध्दृतायाश्च वह्नेः प्रज्वलितस्य च। मोदकानां सुमनसां शुक्लानां चन्दनस्य च॥
मनोज्ञस्यान्नपानस्य पूर्णस्य शकटस्य च। नृभिर्धेन्वाः सवत्साया वडवायाः स्त्रियास्तथा॥
जीवञ्जीवकसिध्दार्थसारसप्रियवादिनम्। हंसानां शतपत्राणां चाषाणां शिखिनां तथा॥
मत्स्याजद्विजशङ्खानां प्रियङ्गूनां घृतस्य च। रुचकादर्शसिध्दार्थरोचनानां च दर्शनम्॥
गन्धः सुरभिर्वर्णश्च सुशुक्लो मधुरो रसः। मृगपक्षिमनुष्याणां प्रशस्ताश्च गिरः शुभाः॥
छत्रध्वजपताकानामुत्क्षेपणमभिष्टुतिः। भेरीमृदङ्गशङ्खानां शब्दाः पुण्याहनिस्वनाः॥
वेदाध्ययनशब्दाश्च सुखो वायुः प्रदक्षिणः। पथि वेश्मप्रवेशे तु विद्यादारोग्यलक्षणम्॥

Dadhyakshata --- lakshanam [*Verse* 71-79] [3]

The above verses contain the description of various auspicious signs which can be seen by the physician on the way to patient's house. If physician sees things or people like curd, Brahmins, bullocks, king, gems, water filled pots, white horse, flag and banners of Lord Indra, fruits, cereals, children seated in elders lap, sweets, blazing fire, white flowers, sandal paste, delicious dishes and drinks, loaded vehicles, cow with calves, woman with children, birds like sparrow, swan, blue jay and peacock, ghee, goat, elephant, fish, ornaments, mirror, white mustard, good fragrances, sweet music, pleasant sounds of birds or animals, unfolding of banners, umbrellas, flags etc, sounds of prayers, drums, conch shell, and Vedic hymns, and pleasant soothing wind coming from south direction etc are considered as positive or auspicious signs and denotes good prognosis.

3. आतुरस्यगृहानां औत्पातिकानि (Prognosis based on inauspicious omens occurring inside patient's house):

प्रवेशे पूर्णकुम्भाग्निमृद्वजफलसर्पिषाम्। वृषब्राह्मणरत्नान्नदेवतानां च निर्गतिम्॥
अग्निपूर्णानि पात्राणि भिन्नानि विशिखानि च। भिषङ् मुमूर्षतां वेश्म प्रविशन्नेव पश्यति॥
छिन्नाभिन्नानि दग्धानि भग्नानि मृदितानि च। दुर्बलानि च सेवन्ते मुमूर्षोर्वैश्मिका जनाः॥
शयनं वसनं यानं गमनं भोजनं रुतम्। श्रूयतेऽमङ्गलं यस्य नास्ति तस्य चिकित्सितम्॥
शयनं वसनं यानमन्यं वाऽपि परिच्छदम्। प्रेतवद्यस्य कुर्वन्ति सुहृदः प्रेत एव सः॥
अन्नं व्यापद्यते अत्यर्थं ज्योतिश्चैवोपशाम्यति। निवातो सेन्धनं यस्य नास्ति चिकित्सितम्॥
आतुरस्य गृहे यस्य भिद्यन्ते वा पतन्ति वा। अतिमात्रममत्राणि दुर्लभं तस्य जीवितम्॥

Praveshe --- jeevitam [*Verse* 32-39] [3]

The above verses contain the description of various inauspicious signs (indicating imminent death of a patient) observed by the physician at or inside the patient's house. If physician sees various auspicious objects departing from the house (water filled earthen pot, ghee, seeds, bullocks, gem stones, idols of deities, Brahmins and clay or mud etc) indicates departing life of the patient. If physician observes broken or burns or split or damaged vessels or objects at patient's house indicates imminent death of that patient. Physician

should carefully observe patient's bed, clothes, vehicle, gait and diet etc and any abnormality or damage or poor condition of those objects or things denotes imminent death to that concerned patient. Food prepared for patient's purpose, if gets spoiled or fire (while cooking food) getting extinguished (though there is no shortage or blockage of fuel and wind) and things or objects or vessels breaking down frequently etc are considered as bad omens which may appear at patient's house and denotes imminent death of concerned patient.

4. आतुरस्यगृहानां प्रशस्तदर्शनानि (Auspicious signs seen in patient's house):

मङ्गलाचारसंपन्नः सातुरो वैश्मिको जनः। श्रद्दधानोऽनुकूलश्च प्रभूतद्रव्यसंग्रहः॥

धनैश्वर्यसुखावाप्तिरिष्टलाभः सुखेन च। द्रव्याणां तत्र योग्यानां योजना सिध्दिरेव च॥

गृहप्रासादशैलानां नागानामृषभस्य च। हयानां पुरुषाणां च स्वप्ने समधिरोहणम्॥

सोमार्काग्निद्विजातीनां गवां नृणां पयस्विनाम्। अर्णवानां प्रतरणं बुध्दिः संवाधनिःसृतिः॥

स्वप्ने देवैः सपितृभिः प्रसन्नैश्चाभिभाषणम्। दर्शनं शुक्लवस्त्राणां हृदस्य विमलस्य च॥

मांसमत्स्यविषामेध्यच्छत्रादर्शपरिग्रहः। स्वप्ने सुमनसां चैव शुक्लानां दर्शनं शुभम्॥

अश्वगोरथयानं च यानं पूर्वोत्तरेण च। रोदनं पतितोत्थानं द्विषतां चावमर्दनम्॥

Mangalaachaara --- avamardanam [*Verse* 80-86] [3]

The above verses contain the description of various auspicious signs (which denotes good prognosis) observed by the physician at or inside the patient's house. Patient and his family members actively involved in performing auspicious activities, availability or abundance of resources like finances, drugs, and other materials required in treatment, wealth, happiness, and positive response in patient's condition after administering drugs etc indicates auspiciousness and good prognosis. Positive dreams such as climbing up the house or palace or mountain or elephant or bullock or horse or another person, seeing moon, sun, fire, Brahmins, cows, persons carrying milk, swimming, improvement from bad situation and seeing ending of bad times etc are considered as auspicious dreams and they denote favourable prognosis. Having a conversation with gods and forefathers in a pleasant atmosphere, seeing white clothes, having meat, fish, poison, getting away from '*amedhya'* (substances which are psychologically harmful), using umbrella, mirror, white flowers, riding horses, bulls and chariots, moving towards north east direction, rising after the fall and defeating enemies etc things seen in dreams indicates auspiciousness. These are all considered as good or positive signs and denotes favourable prognosis.

Jyotishya Shastra, Shakuna & Nimitta:

Various auspicious (positive signs seen on the way to patient's house or at patient's house) and inauspicious (negatives signs seen on the way to patient's house or at patient's house) signs explained in the above four sections can only be understood by '*Jyotishya shastra*' (astrology). '*Jyotishya'* deals with the effects of planetary positions or movements on human behaviour or character or expression in the physical world. It recognizes the influence of planets on human life as well as destiny of human beings. Different energies emitted by different planets reaches the earth and influences human beings and their surroundings. The energies emitted by various planets are absorbed by the human beings, birds, trees, animals, mountains, rivers, oceans and various objects etc on earth. After reaching our surroundings, the planetary energies will influence our thoughts and actions. Hence, the changes or disturbances which we see in our environment are due to particular configuration of planets.

'*Shakuna'* and '*Nimitta'* both are different entities. '*Shankuna'* word denotes a bird and signs related to birds are called as '*Shakunas'*. The word 'Nimitta' denotes 'Reason' or 'Karma' or 'Consequences of past deeds' etc. *Nimitta* doesn't produce any results on its own but it merely indicates the fruits of one's past deeds. '*Nimitta'* denotes omens (good or bad). '*Shakuna shastra*' or '*Nimitta shashtra*' is part of the '*Jyotishya shastra*' (astrology) and an astrologer can predict the outcome by observing the changes in the environment carefully. The omens can be classified as good or bad according to '*Shakuna shastra*' and based on which predictions can be made. Though these concepts don't come under the purview of an *Ayurvedic* physician but they do have clinical importance. If physician confronts with such type of omens (good or bad) in his clinical practice, he should keep his patient under observation for long time to check for any untoward incidents. All these '*Nimitta'*, '*Shakuna'* and '*Jyotishya'* etc gives a clue towards the past deeds of the patient and outcome of patient's clinical condition, hence physician should keep an eye on those signs.

Medical Ethics:

मरणायेह रूपाणि पश्यताऽपि भिषग्विदा। अपृष्टेन न वक्तव्यं मरणं प्रत्युपस्थितम्॥

पृष्टेनापि न वक्तव्यं तत्र यत्रोपघातकम्। आतुरस्य भवेद्दुःखमथवाऽन्यस्य कस्यचित्॥

अब्रुवन्मरणं तस्य नैनमिच्छेश्चिकित्सितुम्। यस्य पश्येद्विनाशाय लिङ्गानि कुशलो भिषक्॥

लिङ्गेभ्यो मरणाख्येभ्यो विपरीतानि पश्यता। लिङ्गान्यारोग्यमागन्तु वक्तव्यं भिषजा ध्रुवम्॥

दूतैरौत्पातिकैर्भावैः पथ्यातुरकुलाश्रयैः। आतुराचारशीलेष्टद्रव्यसंपत्तिलक्षणैः॥

Maranaayeha --- lakshanai [*Verse* 62-66] [3]

After observing the signs of imminent death in a patient, the physician should not convey it to the patient or his family members unless otherwise it is asked for. Breaking bad news (regarding imminent death) to the patient and his family members may cause severe psychological shock to the patient and his family members; hence it should be revealed only when any one ask for this information. Positive information such as good prognostic signs or favourable conditions can be revealed to the patient and his family members even

without asked by them. Physician should not convey the imminent death to the patient and also, he should smoothly avoid treating such type of cases without revealing the truth.

Many practitioners view breaking bad news as a communication skill that is important for clinicians (कुशलो भिषक्) working in end-of-life care, where the news can be that treatment has been unsuccessful leaving few options for disease control, or that death is imminent (मरणं प्रत्युपस्थितम्). Breaking bad news is a multifaceted task that can be managed successfully if it is done correctly. A mental strategy for not only conveying the information, but also dealing with the emotion (यत्रोपघातकम्), the family, and the plan for further care and support can be more easily planned (आतुरस्य भ वेद्दुःखमथवाऽन्यस्य कस्यचित्). This process should be approached with concern for the patient and family receiving this news. [21] Most patients, as they near death (मरणं प्रत्युपस्थितम्), contend with fears, needs, and desires. Dying patients experience fear of pain, fear of indignity, fear of abandonment, and fear of the unknown (आतुरस्य भवेद्दुःखमथवाऽन्यस्य कस्यचित्). Many physicians want to become more comfortable and skilled (कुशलो भिषक्) in addressing the needs of dying patients and their families. [22] Breaking bad news can lead to negative consequences for patients, families, and physicians (आतुरस्य भवेद्दुःखमथवाऽन्यस्य कस्यचित्). In a patient and family centered approach, the physician conveys the information according to the patient's and patient's family's needs by considering the cultural, spiritual, and religious beliefs and practices of the family. [23]

Auspicious Signs of Health / Positive Psychology:

सत्वलक्षणसंयोगो भवितर्वैद्यद्विजातिषु। साध्यत्वं न च निर्वेदस्तदारोग्यस्य लक्षणम्॥
आरेग्याद्बलमायुश्च सुखं च लभते महत्। इष्टांश्चाप्यपरान् भावान् पुरुषः शुभलक्षणः॥

Sattva lakshana --- shubha lakshana [*Verse* 87-88] [3]

People having positive attributes like noble character, faith, religiousness and having positive mindset etc helps to gain physical health and speedy recovery; besides physical health, physical strength, longevity, happiness and life satisfaction etc can also be achieved. Positive psychology (सत्वलक्षणसंयोगो) is the scientific study of a healthy and flourishing life (आरोग्यस्य लक्षणम्). Positive psychology is concerned with positive psychological states (e.g. happiness) (न च निर्वेदम्), positive psychological traits (e.g. talents, interests, strengths of character), positive relationships, and positive institutions. Research has shown that psychological health assets (e.g. positive emotions, life satisfaction, optimism, life purpose, social support) (शुभलक्षणः) are prospectively associated with good health measured in a variety of ways. [24] A good psychological state is an important index of health. Various psychological and psychosocial factors constitute "healthy psychology", such as life satisfaction (सुखम्), optimism, self-esteem, and perception of social support. Research suggests that these factors may influence the course of diseases, patients' recovery and survival (आयुश्च). Psychoneuroimmunology investigates the role of psychological influences on immunological functions of human body. Positive attributes (इष्टांश्चाप्यपरान् भावान्) like dispositional optimism (न च निर्वेदम्), religiousness (भ क्ति), anger control, low pain expectations (न च निर्वेदम्), and external locus of control can promote healing. [25] The above verses have laid down the foundation for the concepts like 'Positive psychology' and 'Psychoneuroimmunology'.

SUMMARY OF INDIRYA STHANA (Table 2 & 3):

वसतां चरमं कालं शरीरिषु शरीरिणाम्। अभ्युग्राणां विनाशाय देहेभ्यः प्रविवत्सताम्॥
इष्टांस्तितिक्षतां प्राणान् कान्तं वासं जिहासताम्। तन्त्र यन्त्रेषु भिन्नेषु तमोऽन्त्यं प्रविविक्षताम्॥

विनाशायेह रूपाणि यान्यवस्थान्तराणि च। भवन्ति तानि वक्ष्यामि यथोद्देशं यथागमम्॥

Vasataam --- yathaagamam [*Verse* 43-45] [3]

End-of-Life signs are described in the following verses. Soul departs from the body and finally enters in to ultimate darkness (at the time of death) when all the systems and organs are disintegrated. Along with the departure of soul from the body all the vital signs also disappear. The above verses denote 'dying process' according to Ayurveda.

प्राणाः समुपतप्यन्ते विज्ञानमुपरुध्यते। वमन्ति बलमङ्गानि चेष्टा व्युपरमन्ति च॥

Pranaa --- vyuparamanti cha [*Verse* 46] [3]

Noisy breathing (death rattle) (प्राणाः समुपतप्यन्ते) occurs in people who are dying and it is presumed to be due to an accumulation of secretions in the airways. Relatives, friends and hospital staff who witness death rattle, find the noise 'distressing'. Anxious relatives ask for explanation, reassurance and discussion about any fears and concerns associated with the terminal phase and 'death rattle'. [26] Dyspnea (the subjective sensation of breathlessness) (प्राणाः समुपतप्यन्ते) is a frequent and distressing symptom, particularly in dying patients. The signs and symptoms of the restlessness (प्राणाः समुपतप्यन्ते) associated with delirium usually seen at the end of life. Delirium and restlessness at the end of life are usually characterized by anguish (spiritual, emotional, or physical), anxiety, agitation and cognitive failure (विज्ञानमुपरुध्यते). [27] Impaired cognition (विज्ञानमुपरुध्यते) is commonly seen in the palliative care population; rates of delirium range from 14–85% and up to 90% of patient's shows some sort of cognitive impairment (विज्ञानमुपरुध्यते) before death. Over 11% of patients receiving hospice care have a primary diagnosis of advanced dementia (impaired cognition and impairments in verbal learning, verbal memory,

verbal reasoning, and/or verbal fluency) (विज्ञानमुपरुध्यते). [28]

Frail older adults are more susceptible to adverse health outcomes, delirium (प्राणाः समुपतप्यन्ते), falls, functional decline (वमन्ति बलमङ्गानि), reduced mobility, social withdrawal, institutionalisation and death. Frailty is a clinical syndrome which is characterized by unintentional weight loss, self-reported fatigue (वमन्ति बलमङ्गानि), slow walking (चेष्टा व्युपरमन्ति), muscular weakness and low levels of energy (वमन्ति बलमङ्गानि). Concept of frailty has been described as a consequence of an accumulation of deficits such as disabilities, diseases, cognitive impairment (विज्ञानमुपरुध्यते), psychosocial risk factors and geriatric syndromes. An individual's frailty index is strongly associated with risk of death. [29] The hypoactive subtype of delirium is characterized by slowed psychomotor function (चेष्टा व्युपरमन्ति), lethargy (वमन्ति बलमङ्गानि) and reduced awareness/interaction with the environment (चेष्टा व्युपरमन्ति). [30]

इन्द्रियाणि विनश्यन्ति खिलीभवन्ति चेतना। औत्सुक्यं भजते सत्वं चेतो भीराविशत्यपि ॥

Indriyaani --- Aavishatyapi [*Verse* 47] [3]

Decline in sensory (vision, hearing, olfaction, gustatory and tactile sensations) and motor function (इन्द्रियाणि विनश्यन्ति) are common with advancing age and also in Alzheimer's dementia (along with cognitive impairment). [31] Delirium is characterised by rapidly emerging disturbance of consciousness (खिलीभवन्ति चेतना) and a change in cognition with fluctuating symptoms and evidence of organic aetiology. [30] Anxiety has physical, social, psychological, spiritual and practical aspects. It can present as agitation, insomnia, sweating, restlessness, tachycardia, hyperventilation, worry, panic disorder, or tension (औत्सुक्यं भजते सत्वम्). Depression (चेतो भीराविशत्यपि), anxiety (औत्सुक्यं भजते सत्वम्), and delirium (खिलीभवन्ति चेतना) are common phenomena associated with terminal and irreversible illness. Depression is both associated with intense suffering and a cause of intense suffering. Advanced disease increases the likelihood of depression. The more symptoms of dying the patients are experiencing the more likely they will feel depressed (चेतो भीराविशत्यपि). [32] End of life processes seems to be associated with trajectories including the physical–psychological–social–spiritual dimension and "terminal drop" sharp and abrupt physiological/psychological/spiritual deterioration). In dying processes, fear/pain/denial seems to be highly associated and fear of death (चेतो भीराविशत्यपि) is common in dying patients. [33]

स्मृतिस्त्यजति मेधा च ह्रीश्रियौ चापसर्पतः। उपप्लवन्ते पाप्मान ओजस्तेजश्च नश्यति ॥

Smriti --- nashyati [*Verse* 48] [3]

FTD (frontotemporal dementia) affects brain regions implicated in motivation, reward processing, personality, social cognition, attention, executive functioning and language (मेधा चापसर्पतः). Neurocognitive dysfunctions (deficits of working memory and auditory phonological memory) (स्मृतिस्त्यजति) and increased disinhibition & impulsivity (inappropriate remarks, embarrassing social behaviour, overspending, pathological gambling and hyperreligiosity) (ह्रीश्रियौ चापसर्पतः) are seen in FTD. Evidence suggests that the presence of autoimmune disorders (ओजो नश्यति) with increased vulnerability for FTD syndromes (उपप्लवन्ते पाप्मान). [34] Neurodegenerative diseases (उपप्लवन्ते पाप्मान), such as Alzheimer's disease (AD), Parkinson's disease (PD), Huntington's disease (HD), amyotrophic lateral sclerosis (ALS), and FTD are associated with a substrate of dysregulated immune responses (ओजो नश्यति) that impair the central nervous system balance. [35] The signs and symptoms of impending death in end-of-life senile dementia (स्मृति मेधा ह्री श्रियौ चापसर्पतः) can be categorized as breathing disorder, consciousness decline, vital power decline (ओजो नश्यति), reduced oral intake, faeces disorder, calm and peaceful character, blood pressure decline, change in skin colour (तेजो नश्यति), patient odour, oedema, preagonal vital power, body temperature decline (तेजो नश्यति), bedsore/wound deterioration (उपप्लवन्ते पाप्मान), body weight reduction, cyanosis, and oliguria. [36]

शीलं व्यावर्ततेऽत्यर्थं भक्तिश्च परिवर्तते। विक्रियन्ते प्रतिच्छायाश्छायाश्च विकृतिं प्रति ॥

Sheelam --- vikritim prati [*Verse* 49] [3]

More than 70 diseases or disorders are associated with the progressive loss of memory and intellectual function known as dementia. Noncognitive symptoms seen in dementia are defined as disturbances in behaviour, mood, belief (delusions), and experience (hallucinations). FLDs (frontal lobe dementias) are often characterized by extreme, marked changes in personality (शीलं व्यावर्ततेऽत्यर्थं) and behavioural disturbances (भक्तिश्च परिवर्तते). FLDs often act childish, show impairments in judgment, socially inappropriate behaviours, and disinhibition (शीलं व्यावर्ततेऽत्यर्थं भक्तिश्च परिवर्तते). Emotional states are often dramatically altered, including manifestations of depression, anxiety, and obsessive behaviours (भक्तिश्च परिवर्तते). FLDs also are associated with hyperorality (excessive eating and drinking), incontinence, apathy, and blunted affect (भक्तिश्च परिवर्तते). [37]

The word '*Chhaya'* denotes skin complexion (is the natural colour, texture and appearance of a person's skin especially face) whereas the word '*Pratichhaya'* denotes shadow or reflections. Various pathological conditions like alteration of skin vascularisation, pigmentation, ageing process and metabolic disorders etc may alter the '*Chhaya'* (छायाश्च विकृतिम्). Alterations in '*Praticchhaya'* (प्रतिच्छायाश्च विकृतिम्) denote hidden, deep seated pathology. In the absence of radiodiagnosis and imaging technology (ultrasound, X-ray, magnetic resonance imaging etc) in ancient India, Ayurvedic practitioners have developed their own methods to diagnose or detect deep seated, invisible, subtle pathologies by studying the body shadows or reflections of the patients. Study of body shadows or reflections may provide information to the minute details or improves attention towards interoceptive signals which leads to the diagnosis of hidden, deep seated, internal pathology which may not be easily visible otherwise. Any abnormalities found in the shadows or reflections of body or body parts (छिन्ना, भिन्ना, आकुला, च्छाया हीना or अधिका, नष्टा, तन्वी, द्विधा च्छिन्ना, विकृता, and विशिरा etc) denote an underlying pathology (which can't be detectable or identifiable by direct examination) and an imminent death.

शुक्रं प्रच्यवते स्थानादुन्मार्गे भजतेऽनिलः। क्षयं मांसानि गच्छन्ति गच्छत्यसृगपि क्षयम्॥

Shukram --- kshayam [*Verse* 50] [3]

Normal ejaculation can be described as propelled, intermittent pulsatile, saccadic, rhythmic forceful. In the case of emission without contribution of the somatic centres, ejaculation was described as quiet emission (शुक्रं प्रच्यवते स्थानात्), dripping or emanation of semen without expulsion or dribbling (शुक्रं प्रच्यवते स्थानात्). Injury of the S2–S4 segments usually induces more urine leaks because of urinary sphincter hypotonia or atonia. Urine leaks and bulbo urethral glands secretions occurring during sexual stimulation can be confounded with semen (शुक्रं प्रच्यवते स्थानात्) by patients of SCI (spinal cord injury). The ejaculation was not rhythmic forceful with complete injury of the S2–S4 segments and in complete SCI at the level of T12 or below, ejaculation was found dribbling (शुक्रं प्रच्यवते स्थानात्). [38] Evidence suggests that there is an increased risk of death in people with chronic pain, particularly from cancer. Musculoskeletal pain may be associated with increased mortality. [39] The types of pain diagnosed in patients at the end of life can be classified in to acute & chronic pre-existing nociceptive pain (such as arthritis), neuropathic pain, inflammatory pain and mechanical pain. Bone and neuropathic pain are most challenging and bone pain may occur with cancer, related to primary tumours of bone, or to metastases. It may occur in other conditions, including Paget's disease, myeloma, lupus, bone abscesses, leukaemia, traumatic fractures and arthritis. Neuropathic pain may be secondary to neuronal tumours, neuronal pressure or involvement of nerves in cancer tumours and multiple sclerosis. [40]

Carcinomas, diseases of organs of pelvic and abdominal cavities (like inflammations, infections, torsions and ischemia), acute abdomen, rupture of aortic aneurysms, cardiovascular and cerebrovascular events, neurological pathologies etc comes under the domain of 'उन्मार्गे भजतेऽनिलः'. Loss of muscle mass (क्षयं मांसानि गच्छन्ति) and strength is common in aged and it is associated with increased dependence, frailty and mortality. Sarcopenia defined as the loss of muscle mass (क्षयं मांसानि गच्छन्ति) and function associated with aging, and cachexia defined as weight loss due to an underlying illness. Cachexia is associated with fatigue, anorexia, decreased muscle strength, anaemia (गच्छत्यसृगपि क्षयम्), hypoalbuminemia and inflammation. Cachexia is associated with cancer and anaemia (गच्छत्यसृगपि क्षयम्). [41]

ऊष्मणः प्रलयं यान्ति विश्लेषं यान्ति सन्धयः। गन्धा विकृतिमायान्ति भेदं वर्णस्वरौ तथा॥

Ushmana --- tathaa [*Verse* 51] [3]

Spontaneous temperature fluctuations are commonly seen in neurological conditions. Hypothermia (ऊष्मणः प्रलयं यान्ति) can be caused by cold exposure, severe infection, spinal cord injury and endocrine abnormalities. Paroxysmal hypothermia with hyperhidrosis (PHH), multiple sclerosis (MS), and Wernicke encephalopathy (WE) are associated with spontaneous episodic hypothermia. Lower body temperatures (ऊष्मणः प्रलयं यान्ति) in patients with infections are associated with an extremely high mortality rate. Hypothermia is one of the most important prognostic factors for poor outcome in trauma patients. Old age, comorbid conditions, and comatose state are associated with an increased incidence of spontaneous hypothermia (ऊष्मणः प्रलयं यान्ति) in patients with brain injury. [42] Two important cutaneous microvascular disorders that may be related to altered reflex or local thermoregulation are 'Raynaud phenomenon' and 'Erythromelalgia'. [43] Decreased local temperature (ऊष्मणः प्रलयं यान्ति) also suggests ischemia or reduced blood flow to that part. Cold clammy skin and extremities are seen in hypovolemic or hemorrhagic shock.

Generalized joint laxity (विश्लेषं यान्ति सन्धयः) is characterized by increased length and elasticity of normal joint restraints, resulting in a greater degree of translation of the articular surfaces. This is detectable as an increased range of motion and increased distractibility. This hyperlaxity (विश्लेषं यान्ति सन्धयः) can be congenital and acquired. Congenital hyperlaxity is usually caused by connective tissue disorders, such as Ehlers-Danlos

syndrome, Marphan syndrome, osteogenesis imperfecta, and benign hypermobility syndrome. [44] Hundreds of volatile organic compounds (VOCs) are emitted from the human body and they vary with age, diet, sex, physiological status and genetic background. Disease specific VOCs (गन्धा विकृतिमायान्ति) can be used as diagnostic olfactory biomarkers of infectious diseases, metabolic diseases, genetic disorders and other kinds of diseases. Pathological processes, such as infection and endogenous metabolic disorders, can influence our daily odour finger prints by producing new VOCs or by changing the ratio of VOCs that are produced normally. VOCs are specific to certain diseases. [45]

The signs and symptoms of impending death in end-of-life senile dementia can be categorized as breathing disorder, consciousness decline, vital power decline, reduced oral intake, faeces disorder, calm and peaceful character, blood pressure decline, change in skin colour (भेदं वर्ण), patient odour (गन्धा विकृतिमायान्ति), oedema, preagonal vital power, body temperature decline (ऊष्मणः प्रलयं यान्ति), bedsore/wound deterioration, body weight reduction, cyanosis (भेदं वर्ण), and oliguria. [36] The cluster of potential signs and symptoms to be anticipated in the last days are pain, dyspnea, delirium, dysphagia, weakening of voice (भेदं स्वरो), loss of appetite, incontinence, dry mouth, and noisy upper airway secretions.[46] Dysphonia (भेदं स्वरो) is frequently an expression of laryngitis, especially when it comes in an immunosuppressed patient, as happens in chronic lymphoproliferation. Dysphonia (भेदं स्वरो) condition due to vocal cord dysfunction must include diseases of the mediastinum, the neck and the brain stem. Dysphonia (भेदं स्वरो) may be the first symptom in the neoplasm of the larynx, the pharynx, the lungs, the thyroid and lymphoma. Mediastinal metastases from the breast, lungs or other cancers of the body can press on nerves directing to the voice box and cause dysphonia (भेदं स्वरो).[47]

वैवर्ण्यं भजते कायः कायच्छिद्रं विशुष्यति। धूमः संजायते मूर्ध्नि दारुणाख्यश्च चूर्णकः॥

Vaivarnyam --- choornaka [*Verse* 52] [3]

The signs and symptoms of impending death in end-of-life senile dementia can be categorized as breathing disorder, consciousness decline, vital power decline, reduced oral intake (कायच्छिद्रं विशुष्यति due to dehydration), faeces disorder, calm and peaceful character, blood pressure decline, change in skin colour (वैवर्ण्यं भजते कायः), patient odour, oedema, preagonal vital power, body temperature decline, bedsore/wound deterioration, body weight reduction, cyanosis (वैवर्ण्यं भजते कायः), and oliguria (कायच्छिद्रं विशुष्यति due to dehydration or hypovolemia). [36] Several patients have reported being thirsty and dehydrated (कायच्छिद्रं विशुष्यति) at the end of their lives. [48] Descriptors used by patients to express degrees of dyspnea or breathlessness (धूमः संजायते मूर्ध्नि ?) (seen in life threatening or life limiting illnesses or at the end of life) fall into the general categories of difficulty with air movement ("I feel that my breathing is more rapid" and "My breath does not go out all the way"), increased effort ("I feel that I am breathing more" and "I feel hunger for more air"), and general distress ("I feel I am suffocating" and "I feel that I am smothering") (धूमः संजायते मूर्ध्नि ?). [49]

Seborrheic dermatitis (SD) is a chronic inflammatory skin disorder characterized in immunocompetent adult patients like AIDS (acquired immunodeficiency syndrome). Dandruff (pityriasis sicca) is defined as fine scalp scaling without the visible presence of inflammation and considered as part of the spectrum of adult SD. The scalp scaling associated with SD and dandruff is bothersome as flakes (दारुणाख्यश्च चूर्णकः), which shed from the scalp. [4] SD is caused by over proliferation of the lipophilic fungus Malassezia. Malassezia can also be seen in internal organs, including the CNS which raises the possibility that Malassezia might be directly contributing to Parkinson's disease. [5] The much higher percentage of positive cultures of Malassezia species in immunocompromised patients confirms that impaired cellular immunity may facilitate fungal survival on the skin.[6] SD is found in increased sebaceous gland activity, immunodeficiency (lymphoma and HIV-AIDS etc), neurological and psychiatric conditions (PD, stroke, Alzheimer's dementia, autonomic dysfunction and major depression), and low ambient temperatures etc conditions. [7]

सततस्पन्दना देशाः शरीरे येऽभिलक्षिताः। ते स्तम्भानुगताः सर्वे न चलन्ति कथंचन॥

Satata --- kathamchana [*Verse* 53] [3]

Diminished (स्तम्भानुगताः) or absent (न चलन्ति) pulses of various arteries indicates impaired blood flow due to a variety of conditions. All pulses (brachial, radial, and ulnar arteries of the upper extremities and the femoral, popliteal, dorsalis pedis, posterior tibial arteries of the lower extremities, aorta and temporal arteries) (सततस्पन्दना देशाः) should be palpated bilaterally. Diminished pulses (स्तम्भानुगताः) are ominous and they suggest cardiac failure or shock. Absent (न चलन्ति) or weak pulses in the arm may result from a coarctation of the aorta. Low volume and amplitude (hypokinetic) of pulse (स्तम्भानुगताः) suggests low cardiac output in shock or myocardial infarction. Idiopathic dilated cardiomyopathy, valvular stenosis, pericardial tamponade, or constrictive pericarditis can also cause low cardiac output and small peripheral pulses. Absence of a pulse (न चलन्ति) could also suggest an

occlusion by thrombus, embolus, or dissection. Unilateral absence of a pulse (न चलन्ति) can aid in the diagnosis of a dissected aortic aneurysm. Intermittent loss of pulse can be seen in cardiac tamponade and cardiac herniation. [50] The 'Pulseless syndrome' or disease or 'Takayasu arteritis' is characterized by pulselessness of the vessels of aortic arch (ते स्तम्भानुगताः सर्वे न चलन्ति) (may be due to narrowing or blockage of vessels by atherosclerosis or thrombosis). [51]

गुणाः शरीरदेशानां शीतोष्णमृदुदारुणाः। विपर्यासेन वर्तन्ते स्थानेष्वन्येषु तद्विधाः॥
Gunaa --- tadvidhaa [*Verse* 54] [3]

शीतोष्ण विपर्यासेन (*Sheetoshna viparyasena*):

Spontaneous temperature fluctuations are generally seen in neurological patients. Thermo-dysregulation can be seen in the patients of spinal cord injury. Hypothermia can be caused by exposure to cold, severe infection, and endocrine abnormalities. Paroxysmal hypothermia with hyperhidrosis (PHH), multiple sclerosis (MS), and Wernicke encephalopathy (WE) are associated with spontaneous episodic hypothermia. Lower body temperatures in patients with infections, trauma, old age, comorbid conditions and coma (due to brain injury) are associated with an extremely high mortality rate. [42] Two important cutaneous microvascular disorders related to altered reflex or local thermoregulation are 'Raynaud phenomenon' and 'Erythromelalgia'. [43] Decreased local temperature (शीतोष्ण विपर्यासेन) also suggests ischemia or reduced blood flow to that particular part. Increased local temperature (शीतोष्ण विपर्यासेन) suggests inflammation or carcinoma (due to high vascularity).

मृदुदारुण विपर्यासेन (*Mridu daruna viparyasena*):

Those structures or body parts which are soft in nature (मृदु) becoming hard or firm (दारुण) on palpation (hard or firm consistency) is considered as *arishta*. For example, on palpation, hard consistency of liver denotes primary or secondary malignancy of liver. On palpation, 'hard but yielding consistency' is found in chondroma, 'bony hard yielding consistency' denotes osteoma, 'stony hard consistency' denotes carcinoma and 'variable consistency' denotes malignancy either carcinoma or sarcoma (मृदु दारुण विपर्यासेन). Various pathological conditions like fibrosis or sclerosis or hyperplasia or patches or lichenification or scaling etc also denote 'मृदु दारुण विपर्यासेन'. Those structures or body parts which are stiff or firm or hard (दारुण) in nature (bones, muscles etc) becoming soft (मृदु) is also considered as *arishta*. Pathological terms like 'Malacia' and 'flaccidity' etc also denotes 'मृदु दारुण विपर्यासेन'.

नखेषु जायते पुष्पं पङ्को दन्तेषु जायते। जटाः पक्ष्मासु जायन्ते सीमन्ताश्चापि मूर्धनि॥
Nakheshu --- moordhani [*Verse* 55] [3]

नखेषु जायते पुष्पम् (*Nakheshu jayate pushpam*):

Green nail syndrome (chromonychia) is a nail disorder characterized by onycholysis and green-black discoloration of the nail bed. *Pseudomonas aeruginosa* is the most commonly identified organism. [52] Abnormalities of nails can be classified in to various categories such as nail shape (koilonychia, clubbing, pincer nail, dolichonychia, bradynychia, parrot beak nail, macro and micronychia), nail surface (beau's lines, longitudinal ridging, nail pitting and onychoschizia), nail attachment (onycholysis and pterygium), nail colour (luekonychia, melanonychia, white nails, splinter haemorrhages, HIV associated dyschromia and red nails and yellow nail syndrome), and abnormalities of lunula. Melanonychia is a longitudinal or transverse brownish black pigmentation of nail seen in lichen planus, melanocytic nevus or malignant melanoma, drugs, hemochromatosis, malnutrition, thyroid disease, smoking, HIV infection, and Addison's disease. Cyanosis may manifest as blue or purple discoloration of the nail bed and digits as a result of lower oxygen saturation. Yellowish discoloration of nails (due to deposition of bilirubin) denotes severe form of liver disease or hemolysis. Splinter hemorrhages in nails are formed by the extravasation of blood and seen in psoriasis, infective endocarditis, rheumatic heart disease, SLE (systemic lupus erythematosus), antiphospholipid syndrome and congenital heart diseases. Nail findings may act as a window to a plethora of possible systemic associations. [53]

पङ्को दन्तेषु जायते (*Panko danteshu jayate*):

Periodontal disease encompasses gingivitis (inflammation of gums) and periodontitis. Periodontitis develops over time with accumulation of dental plaque (पङ्कसंवृताः), bacterial dysbiosis, formation of periodontal pockets (पङ्कसंवृताः), gum recession, tissue destruction, and alveolar bone loss, halitosis and tooth loss. Existing data provide support for a positive association between periodontal disease and risk of oral, lung, and pancreatic cancers. [54]

जटाः पक्ष्मासु जायन्ते (*Jata pakshmasu jayante*):

'जटीभूतानि पक्ष्माणि' denote blepharitis in which eyelashes may become infected, and the individual cilia become matted (जटीभूतानि पक्ष्माणि). Blepharitis can be caused by staphylococci or dermatophytes (*Microsporum canis)* or Yeasts (*Candida* species). The lipophilic fungus *Malassezia furfur*, likely normal microbiota of the adult pilosebaceous unit has been implicated as a cause of blepharitis. [55] *Demodex* infestation (demodicosis or demodicidosis) caused by primary or secondary immunosuppression (malignant neoplasia, hepatopathies, lymphosarcoma, and HIV infections). *Demodex* is an ecto-parasite of pilo-sebaceous follicle and sebaceous gland, typically found on the face

including eye lashes, brows, and scalp. [56] Eyelid deposits like collarettes or cuffs of fibrin (matted, hard scales) (जटीभूतानि पक्ष्माणि) extending from the base of and along lashes as a sleeve is found in Anterior blepharitis (Staphylococcal); Greasy scales (scurf) (जटीभूतानि पक्ष्माणि) on lid margins and around lashes are found in Anterior blepharitis (Seborrheic); Thick lipid secretions (foamy) (जटीभूतानि पक्ष्माणि) with plugged and pouting meibomian gland orifices is seen in 'Posterior blepharitis' / 'Meibomian gland dysfunction' (MGD). [57]

सीमन्ताश्चापि मूर्धनि (*Seemantashchaapi murdhani*):

The scalp is characterized by high follicular density and a high rate of sebum production. The prevalence of increased sebum production is higher in immuno-compromised patients than in healthy adults. Conditions associated with excessive sebum production like seborrheic dermatitis has been reported to occur significantly in AIDS patients. [58] Sudden appearance of 'सीमन्त' (Natural hair part / part line of hair / hair part) over the scalp without any visible cause should be considered as '*Arishta'*. The pathological manifestation of part lines denotes an excessive sebum production (due to an underlying immunocompromised states or carcinomas or opportunistic scalp fungal infections or autonomic dysfunctions etc) due to which the scalp hair becomes sticky or oily or greasy which further may lead to the formation of new part lines (सीमन्त) on scalp. Conditions like skull base tumours or metastatic skull tumours or brain tumours etc may stretch the scalp skin and this mechanical pressure may leads to the formation of new whorls or part lines.

भेषजानि न संवृत्तिं प्राप्नुवन्ति यथारुचि। यानि चाप्युपपद्यन्ते तेषां वीर्यं न सिध्यति॥

Bheshajaani --- siddhyati [*Verse* 56] [3]

Physicians need to recognize that death is inevitable for many medical conditions despite aggressive treatment (भेषजानि यथारुचि). Physicians sometimes fail to provide adequate supportive care (न संवृत्तिं प्राप्नुवन्ति) for their patients near the end of life. Terminally ill patients are those whose expectancy is relatively short and whose treatment has shifted from a curative regimen to supportive or palliative care. Palliative care can be defined as "the active total care of patients whose disease is not responsive to curative regimen" (तेषां वीर्यं न सिध्यति). It affirms the sanctity of life and regards death as a normal process; neither hastens nor postpones death (तेषां वीर्यं न सिध्यति); provides relief from physical and psychological sufferings; and offers a support system for patients and their family members. Hospice care is the final chapter of palliative medicine. It provides support and care for persons in the last phases of terminal illness at home or hospice residential facilities. [59] The above verse denotes the end stages of life or natural process of death where medicine doesn't work.

नानाप्रकृतयः क्रूरा विकारा विविधौषधाः। क्षिप्रं समभिवर्तन्ते प्रतिहत्य बलौजसी॥

Naana prakrutaya --- balaujasi [*Verse* 57] [3]

Aging is associated with a variety of physiological changes and progressive decline in physiological homeostasis (प्रतिहत्य बलम्), both of which lead to alterations in organ functions, functional decline (प्रतिहत्य बलम्), multimorbidity (नानाप्रकृतयः क्रूरा विकारा), and frailty (प्रतिहत्य बलम्). Age dependent changes in the immune system are referred to as immunosenescence (प्रतिहत्य ओजसी) and this may affect the organism's ability to overcome external stressors. As the immune system ages and the normal capabilities of defence against infections and malignant or autoreactive cells declines (प्रतिहत्य ओजसी), increased susceptibility (नानाप्रकृतयः क्रूरा विकारा) to infections, malignancy, autoimmune disorders, and impaired wound repair follow (नानाप्रकृतयः क्रूरा विकारा). Many older adults have mild degrees of immunosuppression as a result of immunosenescence (प्रतिहत्य ओजसी), together with, age related organ changes, comorbidities (क्षिप्रं समभिवर्तन्ते नानाप्रकृतयः क्रूरा विकारा), geriatric syndromes, frailty, malnutrition (प्रतिहत्य बलम्), functional dysfunction and, polypharmacy (विविधौषधाः), all of which affect the prognosis of geriatric patients with infectious diseases.[60] The above verse denotes immunocompromised conditions with multimorbidity and polypharmacy during end stages of life or in life threatening conditions.

शब्दः स्पर्शो रसो रूपं गन्धश्चेष्टा विचिन्तितम्। उत्पद्यन्तेऽशुभान्येव प्रतिकर्मप्रवृत्तिषु॥

Shabda --- pravruttishu [*Verse* 58] [3]

प्रतिकर्मप्रवृत्तिः चिकित्साप्रवृत्तिः।

Pratikarma --- pravrutti [*Chakrapani*, *Verse* 58] [3]

Age-related sensory impairment (शब्दः स्पर्शो रसो रूपं गन्धानि उत्पद्यन्तेऽशुभानि) is a slow and gradual progress and it affects multiple modalities. Older people usually experience a decline in visual acuity due to changes in lens elasticity which leads to a decrease in abilities to focus on near objects (i.e., presbyopia) and to adapt to light (रूपं उत्पद्यन्तेऽशुभानि). Hearing is also well known to decline with age and is usually characterized by a decreased hearing sensitivity, capability to understand speech in a noisy environment, slowed central processing of acoustic stimuli, and impaired sound localization (शब्दः उत्पद्यन्तेऽशुभानि). Deficits in smell and taste (रसो गन्धानि उत्पद्यन्तेऽशुभानि) are highly prevalent in older people. Significant age-related decline in vibrotactile sensitivity (somato sensory systems) (स्पर्शो उत्पद्यन्तेऽशुभानि) is also found in older people. Age related decline in each of these sensory systems (sensory deficiency) (शब्दः

स्पर्शो रसो रूपं गन्धानि उत्पद्यन्तेऽशुभानि) has been well established in the literature. [61] Agnosia is a condition in which patient is unable to recognize and identify objects, persons, or sounds using one or more of their senses (शब्दः स्पर्शो रसो रूपं गन्धानि उत्पद्यन्तेऽशुभानि) despite otherwise normally functioning senses. The deficit cannot be explained by memory, attention, language problems, or unfamiliarity to the stimuli. Usually, one of the sensory modalities is affected (visual or auditory or tactile or gustatory or olfactory agnosia) (शब्दः स्पर्शो रसो रूपं गन्धानि उत्पद्यन्तेऽशुभानि). [62]

Hallucinations (शब्दः स्पर्शो रसो रूपं गन्धानि उत्पद्यन्तेऽशुभानि) are one among the signs, symptoms or premonitions of death (प्रतिकर्मप्रवृत्तिषु). Prior research indicates that BPSD (behavioural and psychological symptoms of dementia) such as hallucination, anxiety, irritation and shouting loudly are commonly observed among end-of-life (प्रतिकर्मप्रवृत्तिषु) dementia patients. It is possible that these could be distinct features of impending death (प्रतिकर्मप्रवृत्तिषु) in elderly people with senile dementia.[63] Hyperactive subtype or Agitated delirium is characterized by inappropriate behaviour (चेष्टा उत्पद्यन्तेऽशुभान्येव) and hallucinations. Delirium in the last few days of life (often referred to as terminal restlessness or terminal agitation) (चेष्टा उत्पद्यन्तेऽशुभान्येव) is often ongoing and irreversible (प्रतिकर्मप्रवृत्तिषु).[30] Hallucinations (शब्दः स्पर्शो रसो रूपं गन्धानि उत्पद्यन्तेऽशुभानि) can be defined as 'the intimate conviction of actually perceiving a sensation for which there is no external object' (शब्दः स्पर्शो रसो रूपं गन्धानि उत्पद्यन्तेऽशुभानि). Hallucinations (शब्दः स्पर्शो रसो रूपं गन्धानि उत्पद्यन्तेऽशुभानि) can be seen in various conditions causing damage to the peripheral sensory pathways, lesions of afferent visual pathways, thyroid dysfunction, Hashimoto disease, deficiencies in D and B12 vitamins, Prader–Willi syndrome, autoimmune disorders, HIV/AIDS, narcolepsy, tumours, traumatic brain injuries, epilepsy, cardiovascular events, neurodegenerative conditions, Parkinson's disease and dementia with Lewy bodies etc. [64] 'शब्दः स्पर्शो रसो रूपं गन्धानि उत्पद्यन्तेऽशुभानि' denote hallucinations and sensory impairment or decline or agnosia etc conditions which are resistant to treatment and progressive in nature (प्रतिकर्मप्रवृत्तिषु) leads to death ultimately.

दृश्यन्ते दारुणाः स्वप्ना दौरात्म्यमुपजायते। प्रेष्याः प्रतीपतां यान्ति प्रेताकृतिरुदीर्यते॥
Drushyante --- udeeryate [*Verse* 59] [3]

Many patients of ICU (intensive care unit) have reported bad dreams or nightmares (दृश्यन्ते दारुणाः स्वप्ना). They are interpreted by patients as an extremely unpleasant dream or 'bad dreams' (दृश्यन्ते दारुणाः स्वप्ना). ICU Patients report hallucinations, nightmares, and disorientation. Nightmares of ICU patients are characterized by 'memories of being held prisoner', 'being strangled or held underwater', and 'being in a foreign country or other world' etc (दृश्यन्ते दारुणाः स्वप्ना). [65] Anger (दौरात्म्यम्) is a predictable part of the dying process. Angry patients frequently try to blame someone for their disposition due to an underlying emotional distress (दौरात्म्यम्). Old unresolved family conflicts of the patient may present as inappropriate patient anger (दौरात्म्यम्) toward the physician, staff, and family members at the end stages of life (प्रेताकृतिरुदीर्यते).[66] The burden of care resulted in many family carers experiencing a range of feelings and emotions (प्रेष्याः प्रतीपतां यान्ति) including fatigue, stress, distress at witnessing disease progression, frustration and uncertainty. [67]

प्रकृतिर्हीयतेऽत्यर्थं विकृतिश्चाभिवर्धते। कृत्स्नमौत्पातिकं घोरमरिष्टमुपलक्ष्यते॥
Prakruti --- lakshyate [*Verse* 60] [3]

औत्पातिकमिति आकस्मिकम्।
Autpaatikamiti aakasmikam [*Chakrapani, Verse* 59] [3]

'Actively dying' is defined as "the hours or days preceding imminent death during which time the patient's physiologic functions wane" (प्रकृतिर्हीयतेऽत्यर्थम्). Actively dying, end of life, terminally ill, terminal care, and transition of care are the five commonly used terms in palliative care. The first four terms (actively dying, end of life, terminally ill and terminal care) involved diagnosis of progressive irreversible disease (विकृतिश्चाभिवर्धते) with a limited prognosis (घोरमरिष्टमुपलक्ष्यते), although there was no consensus on the exact time frame. [68] The above verse denotes various conditions like advanced dementias, delirium and other chronic debilitating diseases which are progressive, irreversible and required palliative or hospice care. The word 'आकस्मिकम्' indicates sudden manifestation of a clinical condition without any visible or known reason (doesn't mean absence of cause).

इतीदमुक्तं प्रकृतं यथातथं तदन्ववेक्ष्यं सततं भिषग्विदा।
तथा हि सिध्दिं च यशश्च शाश्वतं स सिध्दकर्मा लभते धनानि च॥
Iteedamuktam--- dhanani cha [*Verse* 90] [3]

Primary care physicians require a broad knowledge of medicine (भिषग्विदा). Red flags are signs and symptoms found in the patient and their evaluation (तदन्ववेक्ष्यं सततम्) is important. All red flags, whether highly diagnostic or not, general or specific, warn us the possibility of life-threatening disorders. The main aim of the general practitioner is to marginalize danger by recognizing and responding to signs and symptoms (तदन्ववेक्ष्यं सततम्) of possible serious illness. [69] In clinical practice and training, estimating prognosis (the probability of an individual developing a particular outcome over a specific period of time) typically receives less attention than diagnosing and treating disease. Because of

competing chronic conditions and diminished life expectancy, careful consideration of prognosis (तदन्ववेक्ष्यं सततम्) is particularly important for clinical decision making. The goal of estimating prognosis is to improve clinical decision making and, ultimately, patient outcomes (सिध्दकर्मा लभते). [70] The signs and symptoms (*arishta lakshanas*) mentioned in '*Indriya sthana*' are important for physician in clinical decision making; proper understanding and implementation of the concepts mentioned in *'Indriya sthana'*, increases the reputation, wealth and clinical success to physician.

CONCLUSION:

Description of opportunistic infections such as 'Malassezia' in immunocompromised patients, Parkinson's disease, Dementia, Cachexia and Delirium are mentioned in this chapter. Concepts of 'Infrared thermography' or 'infrared imaging' or 'thermal imaging' are also mentioned in this chapter (यस्य स्नातानुलिप्तस्य पूर्वं शुष्यत्युरो). '*Dootadhikara'* section is unique contribution of this chapter. It deals with role of caregiver, positive and negative attributes of caregiver and their influence on prognosis of the patient's condition, caregiver role strain or burden, and complexities between caregiver, care recipient (patient) and physician. Thousands of years before concepts like 'caregiver' and their attributes, caregiver strain or burden, and their role in prognosis were well documented by *Acharyas'*. Points related to medical ethics like 'पृष्टेनापि न वक्तव्यम्' etc are mentioned. Good and bad omens happening on the way to patient's house or at patient's house and seen in caregiver are explained in detailed way. These concepts can only be understood with the help of '*Jyotishya or Shakuna or Nimitta shastra*' only. Studies like individual case reports or case studies, prospective or retrospective longitudinal cohort studies, observational studies, survey studies, and cross-sectional studies are required to substantiate the claims regarding good or bad omen and their influence on prognosis. Red flag signs and symptoms (*arishta lakshanas*) of whole '*Indriya sthana*' are summarized in this chapter and the present chapter is the biggest among all twelve chapters of '*Indriya sthana*'. Basic foundations for concepts like 'Positive or health psychology' and 'Psychoneuroimmunology' etc can be seen in this chapter (सत्वलक्षणसंयोगो). Most of the conditions explained in this chapter and whole *'Indriya sthana'* denotes conditions like 'Actively dying', 'end of life', 'terminally ill', 'terminal care', and 'transition of care' etc which are related to palliative care or hospice care.

Table 1: *Arishta lakshanas* and various other concepts

Arishta lakshana / concept	Relevant disease or pathology or concept
यस्य ---- जीवितम् *Yasya -- jeevitam* (Ch. I. 12 / 3)	Seborrheic dermatitis (SD) & Malassezia infections (dandruff) in immunocompromised patients;
निकषन्निव यः ---- वसति मानवः *Nikashanniva -- maanava* (Ch. I. 12 / 4)	Parkinson's disease (PD);
यस्य ---- सोऽर्धमासं न जीवति *Yasya -- na jeevati* (Ch. I. 12 / 5)	Localized hyperthermia or hypermetabolism or hypervascularization or hyperperfucions due to an underlying inflammation or neoplastic conditions;
यमुद्दिश्यातुरं ----तस्य जीवितम् *Yamuddishya -- jeevitam* (Ch. I. 12 / 6-8)	Not responding to aggressive treatment and progressive deterioration of health indicates end of life stages; Cachexia (cancer induced);
विकार ---- तमुपाचरेत् *Vikaara -- tamupaacharet* (Ch. I. 12 / 15)	Endemic or epidemic diseases; Contagious, infectious diseases;
मरणायेह ---- ध्रुवम् *Maranayeha -- dhruvam* (Ch. I. 12 / 62-66)	Medical ethics;
सत्वलक्षणसंयोगो ---- शुभलक्षणः *Sattva -- lakshana* (Ch. I. 12 / 87-88)	Positive psychology; Health psychology; Psychoneuroimmunology;
अवक्षुतमथोत्क्रुष्टं ---- तदागारं विपश्चिता *Avakshuta -- vipashchita* (Ch. I. 12 / 25-31) प्रवेशे पूर्णकुम्भाग्नि ---- तस्य जीवितम् *Praveshe -- jeevitam* (Ch. I. 12 / 32-39) दध्यक्षतद्विजातीनां ---- विद्यादारोग्यलक्षणम् *Dadhi -- lakshanam* (Ch. I. 12 / 71-79) मङ्गलाचारसंपन्नः ---- द्विषतां चावमर्दनम् *Mangala -- avamardanam* (Ch. I. 12 / 80-86)	Various auspicious and inauspicious signs (good or bad omens) cab be understood only with the help of '*Jyotishya shastra*' / '*Shakuna shastra*' / '*Nimitta shastra*';
इतीदमुक्तं ---- लभते धनानि च *Iteeda -- dhanaani cha* (Ch. I. 12 / 90)	Benefits of prognostication of life expectancy; Proper identification of red flag signs & symptoms;
दूताधिकार (Care giver role & Burden): मुक्तकेशेऽथवा ---- दूता मुमूर्षताम् *Mukta -- mumurshataam* (Ch. I. 12 / 10-14)	Good or bad omens associated with caregiver; Physical and psychological condition of caregiver; Positive and negative attributes of caregiver; Caregiver health impairment;

दीनभीतद्रुतत्रस्त ---- धीरो मरणमादिशेत् *Deena -- maadishet* (Ch. I. 12 / 16-24) स्वाचारं हृष्टम् --- निर्दिशेदगतं भिषक् *Svaachaaram -- bhishak* (Ch. I. 12 / 67-70)	Caregiver role strain; Caregiver burden; Role of caregiver in determining the prognosis of care recipient (patient); Communicative abilities of caregiver; Role and responsibilities of family carers;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

Table 2: *Arishta lakshanas* of whole *Indriya sthana* (Part-1)

Arishta lakshana	Relevant disease or pathology
प्राणाः समुपतप्यन्ते *Praana -- samupatapyante* (Ch. I. 12 / 46)	Death rattle; Dyspnea; Agitation or restlessness seen in Delirium;
विज्ञानमुपरुध्यते *Vignaanamuparudhyate* (Ch. I. 12 / 46)	Cognitive decline or impairment seen in Dementia, Delirium and other neurodegenerative diseases;
वमन्ति बलमङ्गानि *Vamanti balamangaani* (Ch. I. 12 / 46)	Functional decline; Frailty; Slowed psychomotor functions; Fatigue;
चेष्टा व्युपरमन्ति *Cheshtha vyuparamanti* (Ch. I. 12 / 46)	Hypoactive subtype of delirium; Reduced psychomotor activity; Lethargy;
इन्द्रियाणि विनश्यन्ति *Indriyaani vinashyanti* (Ch. I. 12 / 47)	Sensory impairment; Cognitive impairment;
खिलीभवन्ति चेतना *Khileebhavanti chetana* (Ch. I. 12 / 46)	Clouding or disturbance or of consciousness seen in delirium;
औत्सुक्यं भजते सत्वम् *Autsukyam bhajate sattvam* (Ch. I. 12 / 47)	Restlessness or agitation or anxiety seen in delirium; Dying process;
चेतो भीराविशत्यपि *Cheto bhiravishatyapi* (Ch. I. 12 / 47)	End of life processes; Fear of death; Depression; Terminal drop;
स्मृतिस्त्यजति मेधा च *Smritistyajati medha cha* (Ch. I. 12 / 48)	Memory and cognitive impairments seen in Dementias;
ह्रीश्रियौ चापसर्पतः *Hree shriyau chapasarpata* (Ch. I. 12 / 48)	Disinhibition; Behavioural and personality changes seen in FTD (frontotemporal dementia);
उपप्लवन्ते पाप्मान *Upaplavante paapmaana* (Ch. I. 12 / 48)	Multimorbidity; Progressive deteriorating conditions; Neurodegenerative diseases;
ओजस्तेजश्च नश्यति *Ojastejashcha nashyati* (Ch. I. 12 / 48)	Immunosenescence; Immunocompromised states; Hypometabolism or hypoperfusion;
शीलं व्यावर्ततेऽत्यर्थम् *Sheelam --- atyardham* (Ch. I. 12 / 49)	Personality changes in FTD;
भक्तिश्च परिवर्तते *Bhaktishcha parivartate* (Ch. I. 12 / 49)	BPSD (behavioural and psychological symptoms of dementia); Anhedonia; Depression;
प्रतिच्छायाश्छायाश्च विकृतिम् *Pratichhaya -- vikrutim* (Ch. I. 12 / 49)	Pathological changes seen in reflections and shadows; Abnormalities of complexion;
शुक्रं प्रच्यवते स्थानात् *Shukram -- sthaanaat* (Ch. I. 12 / 50)	Incontinence; Dribbling ejaculation in spinal cord injury or pathology; Hypotonia or Atonia;
उन्मार्गे भजतेऽनिलः *Unmaarge bhajate anila* (Ch. I. 12 / 50)	Acute painful emergency conditions; Acute abdomen; Cerebrovascualr accidents; Cardiovascular pathologies;
क्षयं मांसानि असृगपि *Kshayam -- asrugapi* (Ch. I. 12 / 50)	Sarcopenia; Cachexia; Anaemia; Malnutrition;
ऊष्मणः प्रलयं यान्ति *Ushmana -- yaanti* (Ch. I. 12 / 51)	Hypothermia; Cold clammy skin in hypovolemic or hemorrhagic shock;
विश्लेषं यान्ति सन्धयः *Vislesham -- sandhaya* (Ch. I. 12 / 51)	Generalized joint hyperlaxity; Multidirectional instability of joints (MDI);
गन्धा विकृतिमायान्ति *Gandhaa vikrutimaayaanti* (Ch. I. 12 / 51)	VOC (volatile organic compounds) specific to particular diseases;
भेदं वर्णम् *Bhedham varnam* (Ch. I. 12 / 51)	Deterioration of complexion; Cyanosis; Pallor; Hyper or hypo pigmentation;
भेदं स्वरो *Bhedham swaro* (Ch. I. 12 / 51)	Dysphonia; Aphonia; Hypophonia;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

Table 3: *Arishta lakshanas* of whole *Indriya sthana* (Part-2)

Arishta lakshana	Relevant disease or pathology
वैवर्ण्यं भजते कायः *Vaivarnya -- kaaya* (Ch. I. 12 / 52)	Changes in skin colour is one of the signs and symptoms of impending death in end-of-life senile dementia;
कायच्छिद्रं विशुष्यति *Kaaya -- visushyati* (Ch. I. 12 / 52)	Dehydration; Hypovolemia;
धूमः संजायते मूर्ध्नि *Dhooma -- moordhni* (Ch. I. 12 / 52)	Dyspnoea or breathlessness seen in life threatening conditions;
दारुणाख्यश्च चूर्णकः *Daarunaakhya -- choornaka* (Ch. I. 12 / 52)	Malassezia infection (dandruff) in immunocompromised patients;
सततस्पन्दना ---- न चलन्ति कथंचन *Satatam -- kathamchana* (Ch. I. 12 / 53)	Diminished or absent peripheral pulses; Takayasu's arteritis; Atherosclerosis; Thrombosis;
शीतोष्ण विपर्यासेन *Sheetoshna viparyaasena* (Ch. I. 12 / 54)	Hypothermia; Hyperthermia;
मृदु दारुण विपर्यासेन *Mridu -- viparyaasena* (Ch. I. 12 / 54)	Stony hardness in carcinoma; Flaccidity in lower motor neuron diseases; Malacia; Neuromuscular conditions;
नखेषु जायते पुष्पम् *Nakheshu -- pushpam* (Ch. I. 12 / 55)	Leukonychia; Melanonychia; Splinter haemorrhages;
पङ्को दन्तेषु जायते *Pankho -- jaayate* (Ch. I. 12 / 55)	Periodontitis;
जटाः पक्ष्मासु जायन्ते *Jataa -- jaayante* (Ch. I. 12 / 55)	Blepharitis; Malassezia infections in immunocompromised patients;
सीमन्ताश्चापि मूर्धनि *Seemanta -- moordhani* (Ch. I. 12 / 55)	Excessive sebum production in Seborrheic dermatitis (SD) associated with AIDS;
भेषजानि ---- वीर्यं न सिध्यति *Bheshajaani -- na siddhyati* (Ch. I. 12 / 56)	Terminal illness which doesn't responds to aggressive treatment and requires palliative or hospice care;
नानाप्रकृतयः क्रूरा विकारा *Naana -- vikaaraa* (Ch. I. 12 / 57)	Multimorbidity; Progressive illnesses;
विविधौषधाः *Vividhaushadhaa* (Ch. I. 12 / 57)	Polypharmacy;
क्षिप्रं समभिवर्तन्ते *Kshipram samabhivartante* (Ch. I. 12 / 57)	Sudden manifestation; Acute conditions;
प्रतिहत्य बलौजसी *Pratihatya balaujasi* (Ch. I. 12 / 57)	Functional decline; Immunosenescence;
शब्दः स्पर्शो रसो ---- प्रतिकर्मप्रवृत्तिषु *Shabda -- pravruttishu* (Ch. I. 12 / 58)	Sensory impairment; Agnosias; Hallucinations; Abnormal psychomotor activity seen in delirium; various neurodegenerative conditions;
दारुणाः स्वप्ना *Daarunaa swapnaa* (Ch. I. 12 / 59)	Nightmares found in ICU (intensive care urnit) patients;
दौरात्म्यमुपजायत *Dauraatmyamupajayate* (Ch. I. 12 / 59)	Anger in dying patients;
प्रेष्याः प्रतीपतां यान्ति *Preshyaa -- yaanti* (Ch. I. 12 / 59)	Burden or role strain of family carers or caregivers;
प्रकृतिर्हीयतेऽत्यर्थम् *Prakruti -- atyardham* (Ch. I. 12 / 60)	Functional decline; Multi organ dysfunction syndrome (MODS);
विकृतिश्चाभिवर्धते *Vikrutishchaabhivardhate* (Ch. I. 12 / 60)	Progressive conditions which are resistant to treatment;

(Ch. I. xx / yy): Ch - *Charaka samhita*; I - *Indriya sthana*; xx - Chapter number; yy - Verse number

REFERENCES:

1. Panja A. A critical review of rhythmic recitation of Charaka samhita as per chhanda shastra. AYU 2013; 34 (2): 134-142. doi: 10.4103/0974-8520.119665
2. Mayur NS, Bharat C, Namrata C, Bhushan M. Relevance of indriyasthan in the prognosis of diseases: A review. Int. J. Res. Ayurveda Pharm. 2018; 9 (1): 9-12. http://dx.doi.org/10.7897/2277-4343.0913
3. Agnivesha. Charaka samhita revised by Charaka & Drudhabala, commentary by Chakrapanidatta, edited by Jadavji Trikamji Acharya (1st ed). Indriya sthana - 12th chapter: Gomaya choorneeyam indriyam adhyayam. Varanasi: Chaukhamba surbharati prakashan; 2008. p. 371-375.
4. Del Rosso JQ. Adult seborrheic dermatitis: a status report on practical topical management. J Clin Aesthet Dermatol. 2011; 4 (5): 32-38. PMID: 21607192; PMCID: PMC3100109.

5. Laurence M, Benito-León J, Calon F. Malassezia and Parkinson's Disease. Front Neurol. 2019; 10: 758. doi: 10.3389/fneur.2019.00758. PMID: 31396143; PMCID: PMC6667642.
6. Prohic A, Kasumagic-Halilovic E. Identification of Malassezia species from immunocompetent and immunocompromised patients with seborrheic dermatitis. Eur Revr Med Pharmacol Sci. 2010; 14 (12): 1019–1023. Available from: https://www.ncbi.nlm.nih.gov/pubmed/21375133
7. Tucker D, Masood S. Seborrheic Dermatitis. [Updated 2019 Dec 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK551707/
8. DeMaagd G, Philip A. Parkinson's Disease and Its Management: Part 1: Disease Entity, Risk Factors, Pathophysiology, Clinical Presentation, and Diagnosis. P T. 2015; 40 (8): 504-532. PMID: 26236139; PMCID: PMC4517533.
9. Goldenberg MM. Medical management of Parkinson's disease. P T. 2008; 33 (10): 590-606. PMID: 19750042; PMCID: PMC2730785.
10. Bagavathiappan S, Saravanan T, Philip J, Jayakumar T, Raj B, Karunanithi R, Panicker TM, Korath MP, Jagadeesan K. Infrared thermal imaging for detection of peripheral vascular disorders. J Med Phys. 2009; 34 (1): 43-47. doi: 10.4103/0971-6203.48720. PMID: 20126565; PMCID: PMC2804148.
11. Cooksley T, Rose S, Holland M. A systematic approach to the unconscious patient. Clin Med (Lond). 2018; 18 (1): 88-92. doi: 10.7861/clinmedicine.18-1-88. PMID: 29436445; PMCID: PMC6330912.
12. Cruz-Oliver DM. Palliative Care: An Update. Mo Med. 2017; 114 (2): 110-115. PMID: 30228556; PMCID: PMC6140030.
13. Gullett NP, Mazurak VC, Hebbar G, Ziegler TR. Nutritional interventions for cancer-induced cachexia. Curr Probl Cancer. 2011; 35 (2): 58-90. doi: 10.1016/j.currproblcancer.2011.01.001. PMID: 21420558; PMCID: PMC3106221.
14. Grassly NC, Fraser C. Seasonal infectious disease epidemiology. Proc Biol Sci. 2006; 273 (1600): 2541-2550. doi: 10.1098/rspb.2006.3604. PMID: 16959647; PMCID: PMC1634916.
15. Bloom DE, Cadarette D. Infectious Disease Threats in the Twenty-First Century: Strengthening the Global Response. Front Immunol. 2019; 10: 549. doi: 10.3389/fimmu.2019.00549. PMID: 30984169; PMCID: PMC6447676.
16. Sullivan AB, Miller D. Who is Taking Care of the Caregiver? J Patient Exp. 2015; 2 (1): 7-12. doi: 10.1177/237437431500200103. PMID: 28725810; PMCID: PMC5513610.
17. Bevans M, Sternberg EM. Caregiving burden, stress, and health effects among family caregivers of adult cancer patients. JAMA. 2012; 307 (4): 398-403. doi: 10.1001/jama.2012.29. PMID: 22274687; PMCID: PMC3304539.
18. Covinsky KE, Newcomer R, Fox P, Wood J, Sands L, Dane K, Yaffe K. Patient and caregiver characteristics associated with depression in caregivers of patients with dementia. J Gen Intern Med. 2003; 18 (12): 1006-1014. doi: 10.1111/j.1525-1497.2003.30103.x. PMID: 14687259; PMCID: PMC1494966.
19. Dalpai D, Reis RC, de Pádua AC. Effect of caregiver characteristics on dementia management strategies. Dement Neuropsychol. 2016; 10 (2): 143-147. doi: 10.1590/S1980-5764-2016DN1002010. PMID: 29213445; PMCID: PMC5642405.
20. Snellman I, Gustafsson C, Gustafsson LK. Patients' and caregivers' attributes in a meaningful care encounter: similarities and notable differences. ISRN Nurs. 2012; 2012: 320145. doi: 10.5402/2012/320145. PMID: 22701802; PMCID: PMC3371756.
21. Rosenzweig MQ. Breaking bad news: a guide for effective and empathetic communication. Nurse Pract. 2012; 37 (2): 1-4. doi: 10.1097/01.NPR.0000408626.24599.9e. PMID: 22252021; PMCID: PMC5578619.
22. Balaban RB. A physician's guide to talking about end-of-life care. J Gen Intern Med. 2000; 15 (3): 195-200. doi: 10.1046/j.1525-1497.2000.07228.x. PMID: 10718901; PMCID: PMC1495357.
23. Monden KR, Gentry L, Cox TR. Delivering bad news to patients. Proc (Bayl Univ Med Cent). 2016; 29 (1): 101-102. doi: 10.1080/08998280.2016.11929380. PMID: 26722188; PMCID: PMC4677873.
24. Park N, Peterson C, Szvarca D, Vander Molen RJ, Kim ES, Collon K. Positive Psychology and Physical Health: Research and Applications. Am J Lifestyle Med. 2014; 10 (3): 200-206. doi: 10.1177/1559827614550277. PMID: 30202275; PMCID: PMC6124958.
25. Mavros MN, Athanasiou S, Gkegkes ID, Polyzos KA, Peppas G, Falagas ME. Do psychological variables affect early surgical recovery? PLoS One. 2011; 6 (5): e20306. doi: 10.1371/journal.pone.0020306. PMID: 21633506; PMCID: PMC3102096.
26. Wee B, Hillier R. Interventions for noisy breathing in patients near to death. Cochrane Database Syst Rev. 2008; 2008 (1): CD005177. doi: 10.1002/14651858.CD005177. PMID: 18254072; PMCID: PMC6478131.
27. Rome RB, Luminais HH, Bourgeois DA, Blais CM. The role of palliative care at the end of life. Ochsner J. 2011; 11 (4): 348-352. PMID: 22190887; PMCID: PMC3241069.
28. Burton CZ, Twamley EW, Lee LC, Palmer BW, Jeste DV, Dunn LB, Irwin SA. Undetected cognitive impairment and decision-making capacity in patients receiving hospice care. Am J Geriatr Psychiatry. 2012; 20 (4): 306-316. doi: 10.1097/JGP.0b013e3182436987. PMID: 22322907; PMCID: PMC3309124.
29. Pal LM, Manning L. Palliative care for frail older people. Clin Med (Lond). 2014; 14 (3): 292-295. doi: 10.7861/clinmedicine.14-3-292. PMID: 24889576; PMCID: PMC4952544.
30. Harris D. Delirium in advanced disease. Postgrad Med J. 2007; 83 (982): 525-528. doi: 10.1136/pgmj.2006.052431. PMID: 17675545; PMCID: PMC2600115.
31. Albers MW, Gilmore GC, Kaye J, Murphy C, Wingfield A, Bennett DA, Boxer AL, Buchman AS, Cruickshanks KJ, Devanand DP, Duffy CJ, Gall CM, Gates GA, Granholm AC, Hensch T, Holtzer R, Hyman BT, Lin FR, McKee AC, Morris JC, Petersen RC, Silbert LC, Struble RG, Trojanowski JQ, Verghese J, Wilson DA, Xu S, Zhang LI. At the interface of sensory and motor dysfunctions and Alzheimer's disease. Alzheimers Dement. 2015; 11 (1): 70-98. doi: 10.1016/j.jalz.2014.04.514. PMID: 25022540; PMCID: PMC4287457.
32. Fine RL. Depression, anxiety, and delirium in the terminally ill patient. Proc (Bayl Univ Med Cent). 2001; 14 (2): 130-133. doi: 10.1080/08998280.2001.11927747. PMID: 16369601; PMCID: PMC1291326.
33. Renz M, Reichmuth O, Bueche D, Traichel B, Mao MS, Cerny T, Strasser F. Fear, Pain, Denial, and Spiritual Experiences in Dying Processes. Am J Hosp Palliat Care. 2018; 35 (3): 478-491. doi: 10.1177/1049909117725271. PMID: 28823175; PMCID: PMC5794111.
34. Bott NT, Radke A, Stephens ML, Kramer JH. Frontotemporal dementia: diagnosis, deficits and management. Neurodegener Dis Manag. 2014; 4 (6): 439-454. doi: 10.2217/nmt.14.34. PMID: 25531687; PMCID: PMC4824317.
35. Novellino F, Saccà V, Donato A, Zaffino P, Spadea MF, Vismara M, Arcidiacono B, Malara N, Presta I, Donato G. Innate Immunity: A Common Denominator between Neurodegenerative and Neuropsychiatric Diseases. Int J Mol Sci. 2020; 21 (3): 1115. doi: 10.3390/ijms21031115. PMID: 32046139; PMCID: PMC7036760.
36. Hirakawa Y, Uemura K. Signs and Symptoms of Impending Death in End-of-life Elderly Dementia Sufferers: Point of View of Formal Caregivers in Rural Areas: -A Qualitative Study-. J Rural Med. 2012; 7 (2): 59-64. doi: 10.2185/jrm.7.59. PMID: 25649740; PMCID: PMC4309317.
37. Garand L, Buckwalter KC, Hall GR. The biological basis of behavioral symptoms in dementia. Issues Ment Health Nurs. 2000; 21 (1): 91-107. doi: 10.1080/016128400248284. PMID: 10839054; PMCID: PMC2864073.
38. Chehensse C, Bahrami S, Denys P, Clement P, Bernabe J, Giuliano F. The spinal control of ejaculation revisited: a systematic review and meta-analysis of anejaculation in spinal cord injured patients. Human reproduction update. 2013; 19 (5): 507-526. Available from: https://doi.org/10.1093/humupd/dmt029
39. Smith D, Wilkie R, Uthman O, Jordan JL, McBeth J. Chronic pain and mortality: a systematic review. PLoS One. 2014; 9 (6): e99048. doi: 10.1371/journal.pone.0099048. PMID: 24901358; PMCID: PMC4047043.
40. Platt M. Pain Challenges at the End of Life - Pain and Palliative Care Collaboration. Rev Pain. 2010; 4 (2): 18-23. doi: 10.1177/204946371000400205. PMID: 26527076; PMCID: PMC4590058.

41. Ali S, Garcia JM. Sarcopenia, cachexia and aging: diagnosis, mechanisms and therapeutic options - a mini-review. Gerontology. 2014; 60 (4): 294-305. doi: 10.1159/000356760. PMID: 24731978; PMCID: PMC4112511.
42. Wang B, Mustroph ML, Wang H (2016) Spontaneous Body Temperature Fluctuations in Neurological Patients. J Neurol Neurobiol 2 (4): doi http://dx.doi.org/10.16966/2379-7150.127
43. Charkoudian N. Skin blood flow in adult human thermoregulation: How it works, when it doesn't, and why? Mayo Clin Proc. 2003; 78: 603-612. https://doi.org/10.4065/78.5.603
44. Saccomanno MF, Fodale M, Capasso L, Cazzato G, Milano G. Generalized joint laxity and multidirectional instability of the shoulder. Joints. 2014; 1 (4): 171-179. doi: 10.11138/jts/2013.1.4.171. PMID: 25606530; PMCID: PMC4295707.
45. Shirasu M, Touhara K. The scent of disease: volatile organic compounds of the human body related to disease and disorder. J. Biochem. 2011; 150 (3): 257-266. doi:10.1093/jb/mvr090
46. Crow FM. Final days at home. Can Fam Physician. 2014; 60 (6): 543-545, e304-7. PMID: 24925945; PMCID: PMC4055321.
47. Gavrila GA, Mihaila RG, Manitiu I. Differential diagnosis problems in a patient with dysphonia and chronic lymphocytic leukemia. Pak J Med Sci. 2015; 31 (1): 223-225. doi: 10.12669/pjms.311.6091. PMID: 25878649; PMCID: PMC4386192.
48. Baillie J, Anagnostou D, Sivell S, Van Godwin J, Byrne A, Nelson A. Symptom management, nutrition and hydration at end-of-life: a qualitative exploration of patients', carers' and health professionals' experiences and further research questions. BMC Palliat Care. 2018; 17 (1): 60. doi: 10.1186/s12904-018-0314-4. PMID: 29656713; PMCID: PMC5901670.
49. Kamal AH, Maguire JM, Wheeler JL, Currow DC, Abernethy AP. Dyspnea review for the palliative care professional: assessment, burdens, and etiologies. J Palliat Med. 2011; 14 (10): 1167-1172. doi: 10.1089/jpm.2011.0109. PMID: 21895451; PMCID: PMC3189385.
50. Maddury J. Arterial pulse. Indian Journal of Cardiovascular disease in Women. 2017; 2 (4): 99-110. doi: https://doi.org/10.1055/s-0038-1636691
51. Copping GA. Pulseless syndrome. Can Med Assoc J. 1960; 83 (17): 892-894. PMID: 13695385; PMCID: PMC1938783.
52. Bae Y, Lee GM, Sim JH, Lee S, Lee SY, Park YL. Green nail syndrome treated with the application of tobramycin eye drop. Ann Dermatol. 2014; 26 (4): 514-516. doi: 10.5021/ad.2014.26.4.514. PMID: 25143684; PMCID: PMC4135110.
53. Singal A, Arora R. Nail as a window of systemic diseases. Indian Dermatol Online J. 2015; 6 (2): 67-74. doi: 10.4103/2229-5178.153002. PMID: 25821724; PMCID: PMC4375768.
54. Michaud DS, Fu Z, Shi J, Chung M. Periodontal Disease, Tooth Loss, and Cancer Risk. Epidemiol Rev. 2017; 39 (1): 49-58. doi: 10.1093/epirev/mxx006. PMID: 28449041; PMCID: PMC5868279.
55. Klotz SA, Penn CC, Negvesky GJ, Butrus SI. Fungal and parasitic infections of the eye. Clin Microbiol Rev. 2000; 13 (4): 662-685. doi: 10.1128/cmr.13.4.662-685.2000. PMID: 11023963; PMCID: PMC88956.
56. Rather PA, Hassan I. Human demodex mite: the versatile mite of dermatological importance. Indian J Dermatol. 2014; 59 (1): 60-66. doi: 10.4103/0019-5154.123498. PMID: 24470662; PMCID: PMC3884930.
57. Jackson WB. Blepharitis: Current strategies for diagnosis and management. Can J Ophtahlmol. 2008; 43 (2): 170-179. doi: 10.3129/i08-016
58. Grimalt R. A practical guide to scalp disorders. J Investg Dermtol Symp Proc. 2007; 12: 10–14. doi:10.1038/sj.jidsymp.5650048
59. Lee DH. Approach to end of life care. Ochsner J. 2002; 4 (2): 98-103. PMID: 22822325; PMCID: PMC3399266.
60. Esme M, Topeli A, Yavuz BB, Akova M. Infections in the Elderly Critically-Ill Patients. Front Med (Lausanne). 2019; 6: 118. doi: 10.3389/fmed.2019.00118. PMID: 31275937; PMCID: PMC6593279.
61. Cavazzana A, Röhrborn A, Garthus-Niegel S, Larsson M, Hummel T, Croy I. Sensory-specific impairment among older people. An investigation using both sensory thresholds and subjective measures across the five senses. PLoS One. 2018; 13 (8): e0202969. doi: 10.1371/journal.pone.0202969. PMID: 30148857; PMCID: PMC6110574.
62. Kumar A, Wroten M. Agnosia. [Updated 2019 Sep 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK493156/
63. Hirakawa Y, Uemura K. Signs and Symptoms of Impending Death in End-of-life Elderly Dementia Sufferers: Point of View of Formal Caregivers in Rural Areas: A Qualitative Study. J Rural Med. 2012; 7 (2): 59-64. doi: 10.2185/jrm.7.59. PMID: 25649740; PMCID: PMC4309317.
64. Waters F, Fernyhough C. Hallucinations: A Systematic Review of Points of Similarity and Difference Across Diagnostic Classes. Schizophr Bull. 2017; 43 (1): 32-43. doi: 10.1093/schbul/sbw132. PMID: 27872259; PMCID: PMC5216859.
65. Guttormson JL. "Releasing a lot of poisons from my mind": patients' delusional memories of intensive care. Heart Lung. 2014; 43 (5): 427-431. doi: 10.1016/j.hrtlng.2014.04.007. PMID: 24856230; PMCID: PMC4150741.
66. Houston RE. The Angry Dying Patient. Prim Care Companion J Clin Psychiatry. 1999; 1 (1): 5-8. doi: 10.4088/pcc.v01n0102. PMID: 15014699; PMCID: PMC181044.
67. Morris SM, King C, Turner M, Payne S. Family carers providing support to a person dying in the home setting: A narrative literature review. Palliat Med. 2015; 29 (6): 487-495. doi: 10.1177/0269216314565706. PMID: 25634635; PMCID: PMC4436280.
68. Hui D, Nooruddin Z, Didwaniya N, Dev R, De La Cruz M, Kim SH, Kwon JH, Hutchins R, Liem C, Bruera E. Concepts and definitions for "actively dying," "end of life," "terminally ill," "terminal care," and "transition of care": a systematic review. J Pain Symptom Manage. 2014; 47 (1): 77-89. doi: 10.1016/j.jpainsymman.2013.02.021. PMID: 23796586; PMCID: PMC3870193.
69. Ramanayake RPJC, Basnayake BMTK. Evaluation of red flags minimizes missing serious diseases in primary care. J Family Med Prim Care. 2018; 7 (2): 315-318. doi: 10.4103/jfmpc.jfmpc_510_15. PMID: 30090770; PMCID: PMC6060920.
70. Gill TM. The central role of prognosis in clinical decision making. JAMA. 2012; 307 (2): 199-200. doi: 10.1001/jama.2011.1992. PMID: 22235093; PMCID: PMC3273781.

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